

GreenLaw, University of Washington School of Law
Page 1 of 66



April 27, 2004

Mr. Thomas Grim
Document Manager
National Nuclear Security Administration
Livermore Site Office, L-293
7000 East Avenue
Livermore, CA 94550-9234
Phone (925) 422-0704

RE: Draft LLNL SW/SPEIS Comments

Dear Mr. Grim:

GreenLaw is a student-run organization at the University of Washington School of Law that focuses on environmental outreach, education, and advocacy. This letter is to serve as our public comment on the Draft Site Wide Environmental Impact Statement for Continued Operation of Lawrence Livermore National Laboratory and Supplemental Stockpile Stewardship and Management Programmatic Environmental Impact Statement (DOE/EIS-0348, DOE/EIS-0236-S3) ("SW/SPEIS").

The purpose of every environmental impact statement is to provide information to government officials and the public as to the possible adverse effects of proposed actions, so that the agency can make informed decisions. The National Environmental Policy Act ("NEPA") refers to this as giving environmental values "appropriate consideration in decision making" 42 U.S.C. § 4332, Sec. 102(B). The Council on Environmental Quality ("CEQ") reflects the same sentiment by stating: "NEPA procedures must ensure that environmental information is available to public officials and citizens before decisions are made and before actions are taken." 40 C.F.R. 1500.1(b). The Department of Energy ("DOE") affirms its commitment to these ideas, stating: "It is DOE's policy to follow the letter and spirit of NEPA; comply fully with the CEQ

1

GreenLaw, University of Washington School of Law
Page 2 of 66

1/31.04 Regulations...." 10 CFR 1021.101. Despite this assertion, the SW/SPEIS lives up to neither the letter nor the spirit of NEPA and the CEQ guidelines. In form and content, this document fails to provide adequate understanding of the environmental impacts and available alternatives of the proposed actions at the Lawrence Livermore National Laboratory ("LLNL") (including Site 300). Ultimately, this EIS does not support informed agency decision making, validating instead existing DOE decisions.

Our comments and concerns about the SW/SPEIS are broken down into the following eight categories: The National Ignition Facility; Integrated Technology Project; Higher Material Allowances; Waste Stream; Decommissioning and Decontamination, Building Upgrades, & New Construction; Security Risks; International Treaties; and Alternatives Analysis. Each section deals with some of the problems, concerns, questions, and inadequacies related to that portion of the SW/PEIS.

In addition to these particular concerns, we found general inadequacies in the document's analysis and description of impacts of the SW/PEIS, including:

- 2/31.06, 31.02 ○ Use of imprecise and undefined language (e.g., "minimal impacts," "no significant impacts" and "adverse");
- 3/22.02 ○ A tendency to segment impacts into discrete categories rather than considering synergistic effects;
- 2/31.06, 31.02 cont. ○ Failure to consider the impacts that waste production will inevitably have at off-site disposal locations and on transportation routes;
- 3/22.02 ○ Consideration of impacts on a mere ten-year scale rather than a long term basis that realistically encompasses the environmental impact of proposed decisions;
- 2/31.06, 31.02 cont. ○ Consistent references to documents, such as previous EISs, that are not readily available.

Ultimately, the EIS leaves us without an adequate understanding of the magnitude, duration, and extent of the effects of the proposed actions at LLNL.

The following are some of our specific concerns:

2

GreenLaw, University of Washington School of Law
Page 3 of 66

I. THE NATIONAL IGNITION FACILITY

NRDC v. Pena and the requirements of NEPA

The Department of Energy attempts to satisfy the court's order in *NRDC v. Pena* by including a Supplemental Stockpile and Stewardship Management Programmatic Environmental Impact Statement pertaining to the National Ignition Facility ("NIF") in the Lawrence Livermore National Laboratory (LLNL) Site-Wide Environmental Impact Statement (jointly referred to as "SW/SPEIS"). The DOE claims that this will ensure the timely analysis of the proposed use of new materials at the NIF within the environmental impacts being evaluated for the overall continued operation of the LLNL.

DOE's attempt to analyze the environmental impacts of the use of new materials at the NIF in the course of a SW/SPEIS, rather than in a court-ordered Supplemental Programmatic EIS, undermines the court's intent in *Pena*. By relying on a SW/SPEIS, the DOE ignores the procedural considerations of synergistic and cumulative effects, scope of alternatives, and tiering under NEPA.

A. Synergistic and Cumulative Effects

Due to the cumulative and synergistic effects that use of these new materials will have within the Stockpile Stewardship and Management Program, and the material differences in objective between a Site-Wide EIS and a Programmatic EIS, only analysis on a program level is sufficient here. See *Izaak Walton League of America v. Marsh*, 655 F.2d 346 (D.C. Cir., 1981) citing *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.20 (1976.) ("A comprehensive impact statement may be necessary in some cases for an agency to meet this duty. Thus, when several proposals for coal-related actions that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together. Only through comprehensive consideration of pending proposals can the

3

GreenLaw, University of Washington School of Law
Page 4 of 66

agency evaluate different courses of action.") In section M.3.2.1, DOE exemplifies these wide-reaching effects when it indicates that after a plutonium experiment, disassembled containment vessels will be sent to the Nevada Test Site. DOE goes on to demonstrate a lack of program wide analysis when it fails to address cumulative effects of this waste at the Nevada Test Site.

In Section M.3.2.2, the SW/SPEIS also says that materials (depleted uranium, highly enriched uranium, thorium-232, weapons-grade plutonium, tritium) will come from the LLNL tritium facility or the Los Alamos National Laboratory in New Mexico. DOE fails to describe how and by what route these materials will be transported.

In Section M.5.2.11 DOE indicates that the exposure from transport by trucks is negligible. However, they fail to address effects of sitting in traffic next to one of these trucks for an extended period of time (which some sources say might deliver the equivalent of one x-ray worth of radiation). More glaringly, the DOE omits discussion of any reasonably foreseeable consequences from accidents. Nuclear materials trucks are as susceptible to mechanical defects as any other vehicles, as an incident in Bremerton, Washington demonstrated two years ago. See Appendix I, Larry Lange, *Nuclear materials truck disabled on highway*, Seattle Post-Intelligencer (2002). Transport via major highways and through large cities also creates a likelihood of multi-vehicle accidents. The DOE should address these reasonably foreseeable impacts.

Lastly, in Section M.3.1.6, the SW/SPEIS examines the decommissioning and decontamination of the NIF which is expected to generate a total of 263 cubic meters of low level waste and 226 cubic meters of hazardous waste. DOE does not clarify the proposed processes for use or disposal of the waste.

B. Scope of Alternatives

Analysis of "alternatives including the proposed action" is "at the heart of an environmental impact statement," and requires that agencies reasonably explore and objectively evaluate all reasonable alternatives. 40 CFR 1502.14 (1978). The lack of synergistic and programmatic

4

GreenLaw, University of Washington School of Law
Page 5 of 66

- 8/31.01 cont. analyses of these new materials stems in part from an inadequate scope of alternatives. DOE abused its discretion in providing such a limited scope of alternatives. The SW/SPEIS only examines three potential alternatives (no action, proposed action, and reduced operation), and does not indicate the preferred alternative as required by CEQ regulations. This limited examination of alternatives does not meet the NEPA requirement to reasonably explore and objectively evaluate all reasonable alternatives. Furthermore, despite DOE's assertion to the contrary, an alternative proposing the cessation of operations at the NIF would not be unreasonable because the purpose and need is not justified.
- 9/31.01
- 10/26.01
- 11/26.01 DOE states that the purpose of the NIF is to support the need to dismantle weapons and maintain smaller stockpiles and to prevent the spread and use of nuclear weapons worldwide. However, the reported experimental capabilities of the NIF, especially with these new materials, exceed the scope of the purpose and need without justification. The SW/SPEIS discusses the use of the NIF, but fails to adequately examine the urgency or the need for the experiments. More information must be provided to justify the need for reaching ignition and thermonuclear burn.
- C. Tiering**
- 12/31.05 Although agencies may incorporate certain materials by reference, they may not "tier" their Site-Wide EIS to a broader management program where program itself has not been subject to NEPA procedures, even if this will result in a less bulky Environmental Impact Statement (EIS). 42 U.S.C.A. § 4321 et seq.; 40 C.F.R. §§ 1502.20-1502.21. *Northcoast Environmental Center v. Glickman*, 136 F.3d. 660 (9th Cir. 1998). DOE is attempting to tier impact statements in a manner that is inconsistent with the informed agency decision process that is at the heart of NEPA. In order to make an informed program-level decision, DOE should do more than proceed immediately to analysis of impacts at the site-wide level. It should analyze program-level impacts affected by use of off-site raw materials, generation of waste streams, and transportation to and from LLNL. By analyzing the impacts of new materials at a site-wide level, DOE relies improperly on an existing program decision that was made without information about the use of these particular materials.

5

GreenLaw, University of Washington School of Law
Page 6 of 66

II. INTEGRATED TECHNOLOGY PROJECT (AVLIS) & PETAWATT LASER

We are satisfied to see that some of the information regarding the Atomic Vapor Laser Isotope Separation ("AVLIS") and/or Integrated Technology Project ("ITP") has not been classified. However, we have several concerns related to the ITP as described in Appendix N. In general, the analysis is inaccessible to the average reader and fails to provide an understandable comparison of the long-term health and safety risks associated with the ITP.

Programmatic EIS for ITP

- 13/27.01 The ITP was not considered in an Environmental Assessment, and is proposed for the first time in this SWEIS. The ITP will involve many different DOE sites and will pose programmatic risks in terms of feed materials - containers - transportation routes, waste streams and ultimate disposition. The SWEIS should provide an evaluation of real alternatives to the ITP that addresses whether the LLNL is an appropriate location for the project and considers alternatives beyond the limited scope of the proposed action, no action, and reduced action alternatives.

Plutonium Increase

- 14/25.01, 27.02, 33.01 Section 3.3.4 of the SW/SPEIS indicates that the plutonium increase would be from 20 kilograms in any room to 60 kilograms in each of two rooms. However, the SW/SPEIS states that environmental evaluations were performed with 60 kilograms of Material at Risk (MAR) rather than the potential 120 kilograms of MAR as indicated in section 3.3.4. The SW/SPEIS needs to address why the evaluations were based on 60 kilograms of MAR.

Health and Human Safety

- 15/23.02, 33.01 Section 3.6.9 notes that the proposed action for ITP is the source of the largest single increase in health and human safety concerns at LLNL. However, there is insufficient justification for this increase. Further, if the environmental calculations were made with 100 to 120 kilograms of MAR as outlined in the EIS estimate, this increase in health and human safety risks would likely

6

GreenLaw, University of Washington School of Law
Page 7 of 66

15/23.02, 33.01 cont.	<p>be even higher. Inaccurate calculation of risk on the most likely source of increased danger to health and human safety is wholly inadequate for assessment of the true potential for harm from this proposed action. We are left wondering: what the true risk to workers and the general population will be. The draft SWEIS should be re-issued with appropriate calculations of risk, in prose, where risks are not provided in exponential format but are spelled out in a more accessible way such as "one in a million" cancer outcome. Only then could the affected communities adequately evaluate this document.</p>
16/27.03	<p><u>Traffic and Transportation</u></p> <p>Appendix N provides transportation alternatives for the Isotope Separation Step (ISS) of either recycled or un-recycled plutonium byproduct. The two proposed methods entail different destinations (LANL for recycled byproduct and WIPP for non-recycled) and different carriers (9975 containers for recycled and TRUPACT II containers for non-recycled by product). The difference seems to lie in the volatility of the byproducts: non-recycled plutonium byproduct results in transuranic waste (TRU) whereas recycled byproduct does not, and is therefore characterized as low level waste (LLW). Appendix N mentions neither a cost/benefit analysis of the alternatives nor the likelihood that one method will be implemented over another. These issues need to be addressed. Given that there is a greater likelihood that TRU rather than LLW will be transported, this is a material consideration that must be better analyzed and addressed in the consideration of the proposed action scenario. For example, while Appendix N describes the radiation omitted by the carriers as "immeasurably small," Section 5.1.11 provides for a higher dose rate for TRU waste (four as opposed to one millirem per hour). Furthermore, table N.5.2.5-2 assumes a dose rate of 1 mrem/hr, rather than a TRU dose rate of 4 mrem/hr, in its analysis of the collective dose. The SW/SPEIS needs to provide a justification for the assumed rate and all assumptions made in its calculations.</p>
17/04.03	<p><u>Petawatt Laser</u></p> <p>The brief description of the procedure and purpose of the Petawatt Laser Project (PLP) in Section 3.3.11 is not sufficient to inform the public of its possible impacts or benefits. The</p>

7

GreenLaw, University of Washington School of Law
Page 8 of 66

17/04.03 cont.	<p>reader should be able to read the SW/SPEIS and gain a working knowledge of what the PLP is designed to accomplish. Section 5.1.8 regarding air quality suggests that the various proposed laser projects impact air quality. The SW/SPEIS needs to address the impact that stripping electrons from atoms in the Petawatt facility will have on the air quality and radiation. In addition, the effect on workers in the PLP should be included in the evaluation.</p>
18/33.01, 17.01	<p>III. HIGHER MATERIAL ALLOWANCES</p> <p><u>Site 300</u></p> <p>Section 5.3.5 states that "there are no planned projects near the Livermore Site and Site 300 that, in combination with LLNL activities, would have an adverse effect on existing view sheds or the surrounding environment." Though no new projects may be planned, the SW/SPEIS must also consider all possible needs for accommodating and storing higher material allowances for plutonium, tritium and highly enriched uranium. Analysis regarding future storage needs, or other consequences of planned projects, and the related implication of Site 300, should be included in the SW/SPEIS.</p>
19/14.02	<p><u>Geology and Soils</u></p> <p>The SW/SPEIS is internally inconsistent with regard to the Antiquities Act and the handling of any fossils found during new construction. Section 5.3.6.2 includes the following policy for Livermore buildings: "Should any buried fossil materials be encountered, LLNL would evaluate the materials and proceed with recovery in accordance with requirements of the <i>Antiquities Act</i>." However, the Antiquities Act is not mentioned in reference to construction at Site 300. The SW/SPEIS states: "Under the Proposed Action, there would be no impacts to any known fossil deposits. There would be no impacts to any known or exploitable mineral resources or unique geologic features." DOE should state the basis for omitting reference to the Antiquities Act in discussion of Site 300 construction.</p>

8

20/22.02	<p><u>Waste Disposal</u></p> <p>Section 5.3.13.1 states that "LLNL anticipates hazardous material usage rates to increase over the next 10 years" due largely to full implementation of the NIF, BSL-3, and Integrated Technology Program operations. However, the SW/SPEIS does not clearly state how additional waste resulting from higher material allowances will be disposed of following the 10 -year period. The SW/SPEIS also does not address whether material usage rates are expected to continue increasing after the 10-year period.</p> <p>Section 5.3.13.1 notes that LLNL's current waste storage capacity can accommodate increased waste from higher usage rates for the next 10 years. The SW/SPEIS should describe plans for storing additional waste beyond the 10-year period. It should consider, for example, a preliminary injunction against shipments of TRU waste to the Hanford Site, which might complicate interim storage for some LLNL wastes.</p> <p><u>Cumulative Impacts</u></p> <p>Section 5.3.15.3 states that the Proposed Action and No Action Alternative "present substantially the same opportunities for future contamination...." Yet, the Proposed Action includes higher material allowances for plutonium, tritium, and uranium. Given the greater presence of these materials and expected increases in usage rates, the SW/SPEIS should explain its assertion that there is no significant difference between the proposed action and no action, when greater opportunities for future contamination, during internal transport, manipulation, and storage, seem logical under the former. How does DOE justify their assertion?</p> <p>IV. WASTE STREAM</p> <p><u>No Disposal Solution: Bad Policy?</u></p> <p>Section 1.5.2 the SW/SPEIS states that "...no pathway for LLNL to dispose of excess plutonium currently exists." Yet LLNL seeks an increase in the administrative limits for fuel-grade</p>
----------	---

22/33.01 cont.	<p>plutonium by more than 100%. Increased health and safety risks, as well as an increase in the potential for contamination, make higher administrative limits an unjustifiable measure. The SW/SPEIS should address how it is reasonable to allow for the increased production and storage of extremely dangerous substances for which there is no disposal method.</p> <p><u>Increased Chemical Use and Resulting Waste Stream</u></p> <p>In 2002, average quantity of lithium hydride, gasoline and various other chemicals used at the LLNL met the maximum permitted level allowed (Table A.4-3, p. A-170). The SW/SPEIS proposed action plan indicates that the on-site levels of some of these chemicals, including lithium hydride, will be increased. Therefore, new permits will be necessary to increase the permitted levels. If the environmental impacts of chemical use, storage, and the resulting waste stream at LLNL have been calculated based on the quantity of chemicals allowed by current permits, then the issuance of proposed permits allowing for increased quantities of hazardous chemicals on site would require revisiting the environmental impacts to reflect the new, increased quantity of chemicals allowed by the new permits. DOE fails to address this issue, instead stating that these permits will be issued in the future and are thus outside the scope of this SW/SPEIS. The issuance of permits increasing the allowable amounts of hazardous chemicals at LLNL necessitates an analysis of the environmental impact of these chemicals based on the new permits.</p> <p>If, however, actual current chemical use falls below the maximum permitted amount, the SW/PEIS should identify how much the actual environmental impact will increase with an increase in chemical use. Furthermore, if new and non-routine operations are not considered in the scope of this SW/SPEIS, the document should explain how environmental impacts of proposed increases in waste stream materials will be addressed and accounted for. LLNL should articulate procedures it will use to reduce or maintain current waste stream levels, or if waste stream levels will increase, the NEPA process it will use to address the environmental impacts of such increases.</p>
23/22.03	<p>If, however, actual current chemical use falls below the maximum permitted amount, the SW/PEIS should identify how much the actual environmental impact will increase with an increase in chemical use. Furthermore, if new and non-routine operations are not considered in the scope of this SW/SPEIS, the document should explain how environmental impacts of proposed increases in waste stream materials will be addressed and accounted for. LLNL should articulate procedures it will use to reduce or maintain current waste stream levels, or if waste stream levels will increase, the NEPA process it will use to address the environmental impacts of such increases.</p>

GreenLaw, University of Washington School of Law
Page 11 of 66

Transportation of Waste

The accident analysis for TRU waste shipments in appendix J relies on the use of TRUPACT-II shipping containers. However, on March 15, 2004, the DOE announced its plans to use TRUPACT-III containers. See Appendix II (DOE News, 3/15/04). The use of these new containers for transporting TRU waste is not considered. The DOE SW/PEIS needs to analyze the accident safety of the TRUPACT-III containers as an alternative in the shipping of TRU waste, so that the public and agency officials can be informed of the possible risks. It makes no sense to base an agency decision on the safety of containers that will not be used.

24/20.05

The SW/PEIS indicates an intention to ship more than 1000 drums of TRU waste. Despite this huge volume, and the extreme toxic nature of the waste, the DOE has made the determination that the WIPP mobile vendor is categorically exempt. See Section 3.2.9. DOE provides no explanation of why this action is categorically exempt, or why it clearly fits within the DOE regulations for categorical exemption. Instead, the document references an internal memo that is not readily available to the public.

25/20.01

According to the SP/SWEIS, the transportation and disposal of waste stream products will largely be handled by commercial contractors. If there is an increase in the transportation of waste to and from off-site facilities (e.g., transportation of waste drums from the Berkeley facility to LLNL; and transportation of radioactive waste from LLNL to WIPP), the SP/SWEIS must address the increased risk of environmental impacts resulting from transport. Incidents involving Berkeley mixed radioactive wastes, shipped to and stored as low level wastes at Hanford, underline the importance of examining reasonably foreseeable environmental impacts, in a complex where mismanagement occurs quite frequently. See Appendix III, Sasha Sajovic, Hyun Lee and Gerald Pollet, *Washington Beware: A History of Waste Mismanagement at Nine Department of Energy Low-Level Waste Generators Shipping Waste to Hanford* (Heart of America Northwest, 2000) available at www.heartofamericanorthwest.org. Examples of such environmental impacts may be radiation exposure, accidents, spills or terrorist activity en route.

26/20.02

Furthermore, the SP/SWEIS fails to address the impact of choosing commercial contractors to transport and dispose of the waste materials. The SP/SWEIS only addresses accidents involving

11

GreenLaw, University of Washington School of Law
Page 12 of 66

26/20.02
cont.

transport by LLNL vehicles and personnel (page 5.5-16), thus failing to address the large portion of the waste stream transportation and disposal carried out by private contractors and vendors. The SW/SPEIS should address the environmental impact of all transportation and disposal operations, including activity both by LLNL personnel and activity by commercial contractors.

V. DECOMMISSIONING & DECONTAMINATION, BUILDING UPGRADES, NEW CONSTRUCTION

A. Decommissioning and Decontamination (D&D)

Comparison of Impacts of Alternatives

27/31.06
22.07

Section 3.6 "Comparison of Impacts of Alternatives" needs to clearly delineate the varying degrees of impact of the decommissioning and decontamination ("D&D") alternatives. There is no evidence of the effects of D&D in Section 3.6, nor do the tables in any way mention D&D other than a discussion of the historic resources. For example, under the Proposed Action there will be a substantially greater amount of D&D activities (820,000 square feet of floorspace under the Proposed Action versus 255,000 square feet under the No Action Alternative). This will clearly result in greater impacts, such as a higher waste generation, which should be addressed. In the current format, it is extremely difficult for a member of the general public to discern from the SW/SPEIS the various impacts of D&D alternatives. If effects or alternatives are listed in another section of this document, then a citation should be included so that the reader can cross-reference.

Historic and Cultural Resources

28/11.02

A series of inconsistencies concerning potential impacts on historic resources from D&D activities requires further clarification. The first paragraph in Section 5.3.4.2 states, "Impacts to known prehistoric and historic resources at Site 300 would be unlikely to result from the Proposed Action," whereas the second paragraph of Section 5.3.4.2 asserts that the "Proposed Action would have the potential to affect important historic buildings and structures on Site 300

12

GreenLaw, University of Washington School of Law
Page 13 of 66

28/11.02 cont.	through D&D, rehabilitation, and renovation of existing facilities." Additionally, Table 3.6-1 establishes that there are potential impacts from D&D and renovation. Based on these statements, it is uncertain what potential impacts are being evaluated in this document for Site 300.
29/11.03	The SW/SPEIS may not meet the statutory requirements for taking into account impacts on historic buildings before approval of Federal funds. The <i>National Historic Preservation Act</i> requires that agencies, "prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register." 16 U.S.C.S. § 470f (2004). The Programmatic Agreement set out in Appendix G states that no later than the end of February 2005 the National Nuclear Security Administration and University of California will complete their inventory and assessment tasks (Programmatic Agreement, Stipulations, I. a.). If Federal funds are allocated before these assessment tasks are finished, then the DOE will be in violation of 16 U.S.C.S. § 470f. Since this draft EIS relies on a study that is yet to be completed, it does not provide decision-makers and the public with adequate information necessary for decisions and comments. The Draft EIS should be recirculated to include the results of this study so that the public can comment on it.
	<u>Non-radiological Air Quality</u>
30/17.03	Section 5.2.8.1 on non-radiological air quality and D&D, falls short of adequate discussion in two areas. First, the SW/SPEIS does not take into consideration the full range of contaminants that D&D activities may involve. For example, discussion focuses on asbestos contamination, but it does not address any of the other contaminants that may exist in the facility as a result of the particular scientific research that is conducted at LLNL. Discussion of the potential air quality effects of D&D from other sorts of contaminants should be incorporated into the SW/SPEIS. Buildings or floorspace marked for D&D may have been the site of unique exposure to contaminants that, although not common to all of the D&D activities, warrant consideration because of the singular problems they may pose.

13

GreenLaw, University of Washington School of Law
Page 14 of 66

30/17.03 cont.	Second, the section does not address the potential effects on air quality from both the transportation and eventual disposal/storage of contaminated demolished facilities. The potential for adverse air quality effects exists not only at LLNL, but also at any facility to which D&D materials are transported, as well as the regions through which the materials are transported. Such discussion should be incorporated in the SW/SPEIS
	<u>Impacts for Proposed Action -- Site Contamination</u>
31/24.05	The general assertion in Section 5.3.15 "Site Contamination" that there will be minimal soil contamination from the proposed activities, and that cleanup efforts will continue to neutralize this problem does not take into consideration the actual adverse effects on the site while it is contaminated should site contamination arise from D&D activities. Although a contamination problem may be dealt with somewhat effectively through cleanup, the site will still have undergone a certain level of contamination for a certain period of time. The effects of such contamination warrant consideration because of the potential impacts on other LLNL activities, both in the short term and long term.
	<u>Bounding Accident Scenarios and Offsite Transportation</u>
32/25.09	NEPA requires that an EIS include evaluation of reasonably foreseeable adverse effects on the human environment. The bounding accident scenarios described in the LLNL SW/SPEIS do not address the adverse effects of an accident involving D&D activities. Section 5.5 omits any mention of D&D activities and materials arising out of such activities. An accident involving D&D activities and related materials is arguably just as reasonably foreseeable as the accident scenarios involving chemical, radiological and biological materials discussed in Section 5.5. The foreseeability of an accident is apparent in the large scope of D&D (820,000 square feet). In light of the NEPA requirement of evaluation of such adverse effects, the SW/SPEIS should incorporate discussion of reasonably foreseeable adverse effects of D&D accidents.

14

GreenLaw, University of Washington School of Law
Page 15 of 66

32/25.09
cont.

Additionally, there is no evidence of the inclusion of D&D materials in Section 5.5.5 regarding "Offsite Transportation Accident Scenarios." That decontaminated, decommissioned, and/or demolished facilities will, in whole or in part, be transported off LLNL and Site 300 necessitates discussion of the potential for offsite transportation accident scenarios involving these materials.

Disposal of Potentially Contaminated Stored or Surplus Materials

33/22.07

Section A.2.4.18 (Deactivation, Decommissioning and Demolition Projects) highlights the possibility of disposal of stored or surplus materials that may be potentially contaminated. DOE needs to further discuss potential steps for storing and disposing of such contaminated materials including, for instance, its plans for proper disposal, and whether disposal will occur on site or off site. Further examples of omissions can be found in A.3.3.7 and A.3.4.3, which discuss the plans to decontaminate and decommission excess facilities at Site 300, but omit any discussion of disposal.

Section B.4.15.2 asserts that while building debris estimates associated with D&D are included in the SW/SPEIS, additional NEPA review may be required in the future depending on the scale and extent of the work involved. However, if the facilities marked for D&D have already been identified, NEPA review should encompass such D&D activities now, at the project proposal stage, rather than when the project has already begun.

B. Building Upgrades

Seismic Evaluations

34/14.03,
14.01

According to Section 4.8.3, the evaluation of seismic hazards for Site 300 was based on a review of literature; an aerial photographic analysis of the faults and landslides prior to field reconnaissance mapping; and a review of features identified in detailed studies of faulting and geology published over ten years ago. For the Livermore site, the LLNL Site Seismic Safety Program recently performed an assessment of the geological hazards, which is the subject of most of the text of Appendix H: Seismicity. The January 18, 2002 Interagency Committee on

15

GreenLaw, University of Washington School of Law
Page 16 of 66

34/14.03
14.01
cont.

Seismic Safety in Construction ("ICSSC") report requires that evaluation of a specific building for seismic risks in each compliance category—one of which is "geologic site"—be completed by a registered engineering geologist. For Site 300, at least, it appears that the DOE's reliance on secondary sources to evaluate seismic hazards falls below the standard established by the ICSSC report.

If any of the seismic upgrades cited in Section 3.3.18 are scheduled to be completed on buildings at Site 300, the DOE should perform an assessment of the geological hazards similar to what the LLNL Site Seismic Safety Program recently performed for the Livermore Site. At the very least, seismic upgrades scheduled for the Site 300 buildings should be based on primary reconnaissance studies of the building and surrounding area.

In Section 4.8.3, the SW/SPEIS recognizes "moderate to high" potential for ground deformation resulting from landslides at Site 300 but does not explain what specific building seismic upgrades or mitigation plans it may have for the ten buildings that are located on old landslides. DOE should also assess the unique risks of landslides in the Site 300 area relative to potential seismic risks in the areas recognized to have a "moderate to high potential" for ground deformation resulting from landslides.

Seismic Upgrades

Section 3.3.18 "Building Seismic Upgrades" states that 108 buildings have been identified as having potential seismic deficiencies relative to current codes, and that these 108 buildings will be evaluated to ensure compliance with applicable design and construction standards. It is unclear from Section 3.3.18, where these buildings are located (Livermore site or Site 300) or what the "current codes" or "applicable design and construction standards" will be. Appendix H suggests that the standard is "life safety," which is the lowest seismic federal standard. ("...approximately 88 percent of buildings comply with federal seismic 'life-safety' standards and require no further evaluation or mitigation.")

16

GreenLaw, University of Washington School of Law
Page 17 of 66

34/14.03, 14.01 cont.	<p>Executive Order 12941, <i>Seismic Safety of Existing Federally Owned or Leased Buildings</i>, cited in Section 3.3.18, states that the "minimum level acceptable" standards in Executive Order 12941 will be developed by the Interagency Committee on Seismic Safety in Construction ("ICSSC"). The ICSSC issued standards on January 18, 2002 in a report called "Standards of Seismic Safety for Existing Federally Owned and Leased Buildings." See Appendix IV, <i>Standards of Seismic Safety for Existing Federally Owned and Leased Buildings</i>, (Steven A. Cauffman et. al. eds., 2002), available at http://fire.nist.gov/bfrlpubs/build01/PDF/b01056.pdf. The Standards report is advisory in nature and establishes the minimum standard ("Life-Safety") for seismic safety of existing federally owned or leased buildings.</p> <p>The Standards report defines each agency's seismic responsibilities to implement standards for seismic performance levels higher than "Life-Safety" if necessary to carry out its agency mission. For example, the report states that "buildings that must remain fully functional during an earthquake and afterwards ["Operational"] are beyond the scope of the Standards and must be evaluated using appropriate agency specific criteria." The "Operational" standard is the highest seismic federal standard.</p> <p>The SW/SPEIS should explain whether DOE evaluated the seismic safety of each building in relation to the activities conducted in each building. It should then explain whether the scheduled seismic upgrades were developed taking such activities into account. DOE should disclose any gaps between the minimum seismic standard required by the January 18, 2002 ICSSC report and the building seismic upgrades necessary to prevent harm in the event of an earthquake, especially harm resulting from particular nuclear materials and waste present in any buildings.</p> <p>The SW/SPEIS should also disclose whether DOE identified any buildings that must be operational during and after an earthquake and whether DOE applied any agency specific criteria pursuant to the January 18, 2002 ISCCS report. If DOE used agency specific criteria to evaluate seismic deficiencies in buildings that must remain operational during and after an earthquake, it should disclose the specific criteria used.</p>	17
-----------------------------	--	----

GreenLaw, University of Washington School of Law
Page 18 of 66

35/04.02	<p>C. New Construction: High Explosives Development Center Project & Energetic Materials Processing Center Replacement</p> <p><u>Purpose and Need</u></p> <p>The SW/SPEIS does not provide enough information for a reasonable decision because DOE does not explain why existing facilities and equipment are obsolete. Thus, the draft does not establish a reasonable purpose and need for new construction. If the quality of existing facilities and equipment does merit some upgrade, DOE should more clearly delineate the functional difference between shut-down of the activities at Site 300 (which DOE dismisses out of hand) and the reduced action alternative. Again, the SW/SPEIS should outline why DOE requires new construction beyond that already scheduled within the "No Action" alternative, and what additional construction would be proposed under the "Reduced Action" alternative.</p>	36/31.05
37/16.03	<p><u>Cumulative Effects</u></p> <p>The minimal discussion of unavoidable adverse impacts from Site 300 activity is inadequate to compare the combined impacts of the alternatives to the baseline impacts of on-going activity at Site 300. At most, description of baseline as "balance-of-operation" activities allows DOE to act without environmental review on a number of projects: "maintenance", "fire hazard management", safety and health enhancements, asbestos management, custodial services, "reconfiguration of research facilities and offices", "infrastructure projects", and "landscaping". At the very least, DOE has not accounted for the synergistic and cumulative effects of these vaguely-described activities within the draft.</p> <p><u>Endangered Species</u></p> <p>DOE has not presented the requisite information for reasonable decision-making under NEPA regarding impacts on threatened and endangered plant and animal species. DOE has not delineated all impacts on these species. Instead, DOE will need to conference with the U.S. Fish and Wildlife Service at some point in the future in order to get approval for increased "takes" of</p>	18

GreenLaw, University of Washington School of Law
Page 19 of 66

37/16.03 cont.	<p>endangered species. The SW/SPEIS lists no timeline for when the conference will be completed and does not indicate how study results will be incorporated into the final SW/SPEIS. This does not adequately address impacts of new construction on threatened and endangered species.</p> <p><u>Emergency Services</u></p>
38/29.01	<p>DOE assessment of new construction impacts on emergency services is also lacking. While the SW/SPEIS indicates that emergency personnel are rotated between Livermore and Site 300 to meet minimum staffing levels, the draft does not address the impact of new construction and functionality on the sufficiency of emergency personnel. The SW/SPEIS must assess how staff rotation to meet minimum levels would adequately address and contain full-scale emergencies in this earthquake and fire prone site in close proximity to a metropolitan area.</p> <p><u>Archeological Conflict of Interest</u></p>
39/11.01	<p>DOE precautions against archaeological disturbance highlight what appears to be a conflict of interest. With the permission of its very own "LLNL archeologists" DOE has determined that it may disturb prehistoric and archaeological resources at Site 300. These resources are eligible for listing on the National Registry of Historic Places. Yet, DOE has not secured the opinions of independent archeologists, or adequately considered the impacts of disturbing these resources. Given the draft SW/SPEIS's indication that new construction will occur under any of the proposed alternatives, the DOE has a responsibility to evaluate these impacts in an unbiased manner, and in light of the unique qualities of these resources. Curiously, DOE appears very willing to secure outside contractors in other situations. The perspective of independent archeologists is necessary here to ensure informed and unbiased decision-making.</p> <p><u>Wetland Mitigation</u></p>
40/16.02	<p>DOE description of wetland mitigation necessitated by new construction is ambiguous. To fully describe new construction impacts on Site 300 wetlands, the SW/SPEIS must indicate whether DOE seeks to re-establish wetland function (e.g., so much water cycled through so often),</p>

GreenLaw, University of Washington School of Law
Page 20 of 66

40/16.02 cont.	<p>wetland structural components (e.g., presence/absence of certain plant/animal species), or both through mitigation. The draft SW/SPEIS should include comparisons to other DOE wetland mitigation projects to paint a clearer picture of potential "success" of mitigation in light of function/structure goals.</p>
	<p>VI. SECURITY RISKS</p>
41/30.01	<p>A series of projects involving dangerous chemical, biological and nuclear components mentioned in the SW/SPEIS have been summarily dismissed as not requiring NEPA review. These projects pose serious threats to the surrounding population and worker safety. Even the reviewed projects fail to take into account safety hazards posed to the surrounding population by the increased risk of terrorist attack on local targets. For example, the DOE looks at the possible impacts of airplane accidents from local airports. However, despite heightened risk of terrorist attacks after September 11, 2001, the DOE fails to address the effects and probability of larger passenger jet airplanes intentionally crashing into the site. DOE provides substantial analysis of the probability of airplane accidents, but offers no analysis about the perhaps greater likelihood of deliberate terrorist attacks.</p>
42/25.08	
43/30.02, 30.01	<p>A series of recent articles cast serious doubt over the security of nuclear labs throughout America. On January 26, 2004, CNN reported that "there was 'compelling' evidence that security tests have been manipulated since the mid-1980s." See Appendix V, Mike Ahlers, <i>Preview Spoils Nuclear Plant Security Test</i>, available at www.cnn.com. Given that an attack could result in the release of airborne pathogens, causing serious danger in the heavily populated Bay Area, thorough analysis about the attractiveness and vulnerability of LLNL as a terrorist target must be included in any EIS of a nuclear site in a post-September 11 world.</p>
	<p><u>BSL-3</u></p>
44/35.01	<p>The SW/SPEIS does not address safety issues and possible health and environmental impacts of this facility. Working with infectious microorganisms as a "counterterrorism technology"</p>

GreenLaw, University of Washington School of Law
Page 21 of 66

44/35.01 | creates the possibility of accidental release with devastating consequences. Ironically, while
cont. | addressing counterterrorism, there is no indication of the possible impacts of acts of terrorism on
the facility.

Container Security Testing Facility

45/38.01 | DOE also neglected to address any possible impacts of this facility including only vague
information about the possible dangers imposed by its creation. In Section 3.2.5 DOE
determined that this facility is "categorically excluded from further NEPA review." However,
there is no indication DOE has performed any, let alone adequate, NEPA review already.
Additionally, the EIS indicates that this facility poses chemical, radiological, and 'other' dangers
without addressing the possible impacts on surrounding population, worker health, and the
environment. Section 3.2.5 mentions use of 'various actual or simulated threat materials' which
terrorists may bring into the country poses serious threats to the surrounding area. The
SW/SPEIS should address which materials might likely be used, the impacts of each of these
materials, and what precautions are being taken to prevent accident and attack.

International Security Research Facility

46/31.09 | With its concentration on computer intelligence, this facility appears innocuous. However, it too
should be subject to some NEPA review. At a minimum, this project causes further building in
the area and increased traffic. NEPA review is not reserved solely for toxic agents in large scale
construction, which a new security facility certainly invokes. The effects of further building and
increased traffic should be addressed in the SW/SPEIS.

VII. INTERNATIONAL TREATIES

47/01.01 | The SP/SWEIS is deficient in meeting NEPA requirements. The Council on Environmental
Quality's *Regulations for Implementing NEPA* Sec. 1502.16 states that an EIS "...shall include
discussions of: (c) Possible conflicts between the proposed action and the objectives of Federal,

21

GreenLaw, University of Washington School of Law
Page 22 of 66

regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies
and controls...." Section 1.6.1 states "treaty compliance will be considered in preparing a ROD
[Record of Decision]." An international treaty, and other international law entered into by the
US, constitutes federal law. *The Paquete Habana*, 175 US 677 (1900). It would benefit the
public, interested parties, and policy makers in determining the appropriate action alternative to
have all information regarding the relation of applicable treaties to these actions, especially in
light of the stated purpose in the SW/SPEIS ("continued operation of LLNL is critical
to...preventing the spread and use of nuclear weapons worldwide (Section 1.3).").

DOE has, in the past, set an important precedent by conducting Nonproliferation Impact Reviews
("NIR's") for other contentious programs including the Role of the Fast Flux Test Facility
(December 2000) and for the Stockpile Stewardship and Management Program (September
1996). Nonproliferation Analyses were conducted in the following DOE EIS or SWEIS review
documents:

47/01.01
cont.

- o Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex (September 2001);
- o Final Environmental Impact Statement for the Production of Tritium in a Commercial Light Water Reactor (March 1999);
- o Final Environmental Impact Statement on Management of Certain Plutonium Residues and Scrub Alloy Stored at the Rocky Flats Environmental Technology Site (August 1998);
- o Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling (October 1995).

In evaluating the alternatives for the LNL, the SW/SPEIS should consider the effects of the
proposed actions on the federal policies of the non-proliferation treaties and international
agreements. A number of treaties and international agreements, including but not limited to the
following, have not been properly addressed:

22

GreenLaw, University of Washington School of Law
Page 23 of 66

47/01.01
cont.

- *The Treaty on the Non-Proliferation of Nuclear Weapons* ("NPT") (Entered into force March 5, 1970) – The United States Government along with other ratifying states declared "...their intention to achieve at the earliest possible date the cessation of the nuclear arms race and to undertake effective measures in the direction of nuclear disarmament." The SW/SPEIS should address how all the alternatives would meet these goals.
- *The Mission Treaty Control Regime* (1987) ("MTCR") – John Schlosser, Director, Office of Export Controls and Sanctions, Bureau of Nonproliferation, stated, "One of the key instruments in curbing missile proliferation is the Missile Technology Control Regime...[It] is the focal point of international efforts to curb the proliferation of missiles. The MTCR is not a treaty, but a political understanding among states that seek to limit the proliferation of missiles and missile technology...The *United States* encourages all governments to do so and to enforce vigorously controls on missile-related items." (in *Remarks to the Transshipment Enforcement Conference for Middle East States*, Barcelona, Spain, May 20, 2002) (emphasis added). The SW/SPEIS should address how all the alternatives would meet these goals.
- *The Convention on the Physical Protection of Nuclear Material Article* (Ratified by the United States Feb. 8, 1987) – Section 4(4) "Each State Party shall apply within the framework of its national law the levels of physical protection described in Annex I to nuclear material being transported from a part of that State to another part of the same State...." The SW/SPEIS should outline how DOE plans to follow Annex I for the transportation of nuclear materials to, from, and within LLNL.
- *START I and START II* – "The Parties [US and Republics of the former USSR] agree that, in the event of the emergence in the future of a new kind of arm that one Party considers could be a new kind of strategic offensive arm, that Party shall have the right to raise the question of such an arm for consideration by the Joint Compliance and Inspection Commission in accordance with subparagraph (c) of Article XV of the Treaty." The SP/SWEIS should outline how site investigations will be conducted for compliance. It

23

GreenLaw, University of Washington School of Law
Page 24 of 66

47/01.01
cont.

should also detail how all the alternative actions would further the goals of Start II, which enters into force in December 2004. In step seven of the *Programme of Action (Next Steps) on Nuclear Disarmament*, the United States government agreed to the "early entry into force and full implementation of START II and the conclusion of START III as soon as possible..."

- Page: 24
Programme of Action (Next Steps) on Nuclear Disarmament (Sixth NPT Review Conference, May 20, 2000) – The United States agreed to follow several other steps leading to nuclear disarmament. Step six states the goal: "An unequivocal undertaking by the nuclear weapon states to accomplish the total elimination of their nuclear arsenals leading to nuclear disarmament to which all States parties are committed under Article VI." Step nine outlines several goals including:
 - "Further efforts by the nuclear weapon States to reduce their nuclear arsenals unilaterally;"
 - "Further reduction of non-strategic nuclear weapons"
 - "A diminishing role for nuclear weapons in security policies to minimize the risk that these weapons ever be used and to facilitate the process of their total elimination."

The *Programme of Action* also calls for a ratification of the comprehensive test ban treaty. Enabling LLNL to go forward with making the "enhanced test readiness" would undermine this objective. The SW/SPEIS should address how all the alternatives would meet these goals.

48/01.02

- *Biological Weapons Convention* (entered into force on March 26, 1975) – "Under the terms of the convention, the parties undertake not to develop, produce, stockpile, or acquire biological agents or toxins." The SW/SPEIS should address how BioSafety Level 3 Laboratory meets the conditions of this agreement. The document should also

24

GreenLaw, University of Washington School of Law
Page 25 of 66

48/01.02 cont.	analyze how the labs will deal with the difficult legal issues presented by the potential "duel usefulness" of these experiments for offensive and defensive purposes.
	VIII. ALTERNATIVES ANALYSIS
	<u>Adequacy of Information in § 3.6.1</u>
49/31.06	Section 3.6.1 of the SW/SPEIS contains the comparison of impacts of alternatives. The limited discussion of differences and the simplified table of figures (Table 3.6-1), do not provide enough information, or direction to further information, for decision-makers or the public.
50/15.02	Environmental justice issues in this section, for example, are only discussed with regard to possible employment opportunities under the various alternatives. Importantly, environmental justice issues are also raised by the siting of toxic waste in near economically and socially disadvantaged peoples. Waste shipments to Hanford, for example, should be evaluated for environmental justice impacts, given the right of Native Americans to live and fish along the Columbia River in the vicinity of the Hanford Reservation. Table 3.6-1 addresses environmental justice but gives no discussion or detail. Table 3.6-1 also addresses biological resources and mentions (but does not define) "minor direct and indirect loss" of animals. Section 3.6.4 states (with no detail) that the biological impacts of the endangered and threatened species would be the same under all of the alternatives.
51/16.03	
52/31.06	If the SW/SPEIS discusses environmental justice, biological resources, or any of these other issues, in greater detail elsewhere, the comparison of alternatives should be cross-referenced with these more detailed sections. The public is otherwise deprived of an informed evaluation of the issues at play and the fair opportunity to verify the analyses.
	<u>Vagueness</u>
	The SW/SPEIS continuously uses vague terms in describing effects and impacts. For example, the word "minimal" is used 110 times in the document without ever defining what it means
	25

GreenLaw, University of Washington School of Law
Page 26 of 66

52/31.06 cont.	(similar terms include "negligible", "no significant," "disproportionately high," "adverse" and "small"). Similarly, Section 5.3.6.2 states, "Only the best management practices would be employed to minimize erosion resulting from ongoing operations; no additional impacts are expected." However, without defining and describing these "best management practices," neither decision-makers nor the public can meaningfully evaluate this alternative. Vague language like this, which permeates the document, does not provide a meaningful accounting of impacts.
	<u>Range of Alternatives</u>
53/31.01	The SW/PEIS fails to meet its goals of informed agency decision making because of its inadequate assessment of a reasonable range of clearly defined alternatives. First, the differences between the No Action Alternative and the Reduced Operations Alternative are not clearly defined. For example, in Table 3.6-1 there is little appreciable difference between the two alternatives besides reduced workforce and its related factors. The SW/SPEIS made a good faith effort to provide sharply defined distinctions between and thus a clear basis for choice among the options as set out in CEQ regulation § 1502.14.
	DOE also fails to consider a reasonable range of alternatives. The SWEIS in Section 3.1 claims that it considers a range of reasonable alternative from the minimum sustainable level (the reduced action alternative) to the highest reasonable activity levels (the proposed action alternative). But instead of considering alternatives in the range of minimum to maximum, they consider only the extremes, and the CEQ mandated No Action alternative. Further, the No Action Alternative does not appear to be "no action".
54/05.01	Finally, Section 3.2 states, "The No Action Alternative has been analyzed to comply with CEQ's NEPA implementing regulations (40 CFR Parts 1500-1508), providing a baseline against which the impacts of the Proposed Action and Reduced Operation Alternative can be compared." A baseline, by definition, is an option where the results of an action are already known. However, the "No Action Alternative," in this document does not serve as a baseline since it provides for future activities that have not occurred and been evaluated for impacts.
	26

GreenLaw, University of Washington School of Law
Page 27 of 66

IX. CONCLUSION

This document fails to provide, through form or content, an adequate understanding of the environmental impacts and alternatives of the proposed actions at LLNL. This environmental review ultimately does not serve to create informed agency decision making, but appears instead to validate existing DOE decisions. This is especially evident in the choice of alternatives and the inclusion of a supplemental programmatic EIS within a site-wide EIS. We look forward to whatever measures DOE may take (e.g., a supplemental EIS) to rectify these inadequacies. The potential consequences of activities (reduced or increased) at LLNL are too grave and far-reaching to proceed without a more adequate review.

Sincerely,
GreenLaw*
University of Washington School of Law
William H. Gates Hall
University of Washington
Seattle, Washington 98195

*These comments were drafted by University of Washington students Patrick Delahunty, Julie Fields, Heather Foe, Rachel Gold, Zach Hiatt, Dylan Higgins, Carole Holley, Zac Hostetter, Tyson Kade, Kris Larson, Katie Meyer, Jason Morgan, Margaret Pak, Josh Piper, Sasha Sajovic, Zach Tyler, Alyssa Vegter, Nick Vickstrom, Jimmie Wilkson, Seth Woolson

GreenLaw, University of Washington School of Law
Page 28 of 66

Nuclear-materials truck disabled on highway

A scare raises serious concerns about safety

Thursday, June 27, 2002

By LARRY LANGE
SEATTLE POST-INTELLIGENCER REPORTER

A Navy truck carrying an empty tank used to haul radioactive liquid briefly closed one lane of a state highway in Bremerton yesterday when a rear brake overheated. The incident raised new questions about the movement of hazardous material across the state.

"The brakes overheated about 200 yards from the Puget Sound Naval Shipyard gate, sending smoke into the air from a rear wheel. The driver of the Navy truck cooled the brakes with an extinguisher.

"There was no radioactive release, there were no injuries and there was no public hazard," State Patrol Trooper Glen Tyrrell said.

But the incident was another reminder that radioactive material crisscrosses Puget Sound and the country every day, and some watchdog groups believe the risk of accidents releasing radiation could increase in coming years.

There have been auto accidents in Eastern Washington caused by dust storms in the arid region, said Hyun Lee, an attorney with Heart of America Northwest, a group monitoring the Hanford Nuclear Reservation.

"If that happened with a truck full of low level radioactive waste on a dusty, windy day, this stuff could get dispersed in the air," he said. Lee said the situation would worsen if hazardous materials, which can be flammable or corrosive, were added to the mix.

In yesterday's incident, the truck was hauling the tank to the Naval shipyard from the Bangor submarine station shortly before 11:30 a.m. when the brakes overheated.

A shipyard spokeswoman, Mary Anne Mascianica, said the tank was being taken to the shipyard for disposal. She could not say what radioactive liquids had been in it but said the tank had been recently cleaned.

Radioactive material and other forms of hazardous waste are hauled around the Sound and the country in "vast numbers," said Jerry Amato, an administrator for the Federal Motor Carrier Safety Administration.



Trooper Scott Gordon, right, and enforcement officer Jeff Osberg check the truck whose brake problem raised an alarm in Bremerton yesterday. The tank it carries is used for radioactive waste but was empty at the time. Melina Mara / Seattle Post-Intelligencer
Click for larger photo

55/04.01,
31.04

GreenLaw, University of Washington School of Law
Page 29 of 66

The material ranges from common household items such as drain cleaner to automotive fuel, up to high-radiation nuclear waste and explosives.

Most of the materials are well-packaged and carried in small amounts that don't require a permit, Amato said, so there's no easy way to estimate the amount moved.

"The numbers are staggering," he said. "I don't know that anybody has that kind of (tracking) system."

In response to the terrorist attacks in September, there was some talk about improving the tracking for the shipment of radioactive material, said Sheryl Hutchison, spokeswoman for the state Department of Ecology.

"I think that's probably still under discussion," she said. "No proposal has come out of it."

In the meantime, the amount of radioactive material being transported is expected to increase.

The Hanford Nuclear Reservation in southeastern Washington is developing plans to increase the amount of radioactive waste it will receive from bomb-making facilities. There are also plans to accept radioactive waste mixed with hazardous chemicals, as well as material that is radioactive for thousands of years.

Under the new plan, a minimum of 70,000 trucks over 40 years will rumble into Washington carrying the deadly material, according to Heart of America Northwest.

And there are concerns about the shipment of waste from Hanford and the state's commercial reactor to a national waste repository. The U.S. Senate plans to decide soon whether to remove the last political hurdle to burying the waste in Nevada's Yucca Mountain, and opponents are using the transportation issue in an uphill effort to sway lawmakers to vote against the project.

Waste could be packed in massive casks and transported on highways.

Watchdog organizations are concerned about high levels of exposure, even if there are no accidents.

In Washington, the waste would travel within a mile of 87 schools and five hospitals, according to an analysis of shipping routes by the Environmental Working Group, a D.C.-based national research group. They also found that there were 366 fatal tractor-trailer wrecks from 1994 to 2000.

P-I reporters David Eggert and Lisa Stiffler and The Associated Press contributed to this story. P-I reporter Larry Lange can be reached at 206-448-8313 or larrylange@seattlepi.com



The truck was hauling an empty tank to the Naval shipyard from the Bangor submarine station shortly before 11:30 a.m. when a brake overheated. *Melina Mara / Seattle Post-Intelligencer*
Click for larger photo

GreenLaw, University of Washington School of Law
Page 30 of 66

U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico 88221

Media Contacts

Dennis Hurt
U.S. DOE Carlsbad Field Office
(505) 234-7327

Bobby St. John
Washington TRU Solutions LLC
(505) 234-7348
<http://www.wipp.ws>

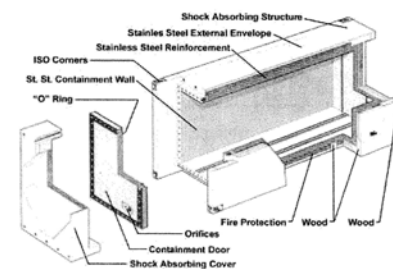
DOENews

For Immediate Release

DOE Looks at New Shipping Package for WIPP Use

CARLSBAD, N.M., March 15, 2004 – A new transuranic (TRU) waste transportation package may soon be in use for Waste Isolation Pilot Plant (WIPP) shipments. Packaging Technology, Inc. of Tacoma, Washington, has submitted a safety analysis report to the U.S. Nuclear Regulatory Commission (NRC) seeking approval for the new Type B transportation package.

DOE is considering the new package, known as the Transuranic Package Transporter Model III (TRUPACT-III), for shipping large boxes of contact-handled TRU waste to WIPP. The TRUPACT-III is a rectangular package that measures 8'2" x 8'8" x 19'10.5". This new type of package would avoid the need to repack waste in the large boxes into smaller containers to fit into existing shipping containers. Large waste boxes account for about 25 percent of the current TRU waste inventory.



-More-

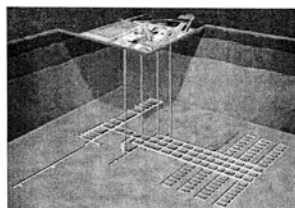
-2-

Use of this new package and elimination of repackaging will simplify handling, avoid unnecessary radiation exposure to workers and reduce the overall number of shipments to WIPP by approximately 2,900.

The TRUPACT-III relies on a single, integrated structure to protect the waste containers that are placed inside it.

To obtain NRC certification, it must meet the same stringent requirements for normal transportation conditions and for severe accidents that existing certified containers must meet. The certified containers now used to transport TRU waste include the TRUPACT-II, HalfPACT, RH 72B and CNS 10-160B. All WIPP shipping packages must meet the rigorous NRC requirements before NRC certifies them for use. NRC approval is expected to take approximately 13 months.

DOE continues to seek improvements in transportation and operations, as well as its robust protection for human health and the environment.



WIPP is the nation's solution for cleaning up defense-generated transuranic waste located at DOE sites across the country. In operation since March 1999, WIPP has received over 2,300 waste shipments and has safely disposed of more than 18,000 cubic meters of transuranic waste in the repository located nearly one-half mile underground.

-30-

003DR0304

Washington Beware:

A History of Waste Mismanagement at Nine Department of Energy Low-Level Waste Generators Shipping Waste to Hanford-

Demonstrating the Need to End Offsite Waste Burial at Hanford and to Investigate and Remediate Hanford's Low-Level Waste Burial Grounds

Primary Author: Sasha Hallissey Sajovic
with
Hyun S. Lee, J.D., L.L.M.
Gerald M. Pollet, J. D.

Heart of America Northwest

February 2000

1. Summary of Findings and Introduction to Off-Site Low-Level Waste at Hanford

The United States Department of Energy (DOE) has demonstrated a long history of mismanagement of Low-Level radioactive wastes shipped to Hanford for burial, which has detrimentally impacted the environment of the State of Washington. This report shows that this mismanagement includes violations of federal and state hazardous waste laws, which did not end years ago as is often claimed. Therefore, the State of Washington and its Department of Ecology must bar the shipment of any additional off-site low-level waste (LLW) to the Hanford site for disposal. The state has the authority to bar such wastes, and moreover, the responsibility to do so.

This report documents that Hanford's Low-Level Burial Grounds (called LLBGs) are, in fact, Dangerous Waste landfills that violate federal and Washington State laws governing dangerous and hazardous waste landfills (i.e., Washington Administrative Code [WAC] 173-303-665, requiring "owners and operators of facilities that dispose of dangerous waste in landfills" to have liners and leachate collection systems). The Low-Level Burial Grounds are also in violation of the State of Washington's laws requiring investigation of potential contamination of groundwater and clean-up "within reasonable time period" WAC 173-303-645(11). Washington State has the authority to require corrective action, monitoring and the cessation of burial (especially of offsite wastes, burial of which does not help cleanup Hanford). SEE WAC 173-303-645(12), and 646(4). **Most importantly, the State of Washington lacks legal authority to make any deal with the DOE to make Hanford's Low-Level Burial Grounds a National Radioactive Waste Dump for offsite waste because the LLBGs are illegally operated dangerous waste landfills that fail to meet the most basic requirements for landfills containing dangerous waste. The proposed "deal" between Governor Locke and the USDOE to accept offsite wastes would be "ultra vires" (an agreement for which the state lacks legal authority) and illegal.**

GreenLaw, University of Washington School of Law
Page 33 of 66

Based on DOE's long history of waste mismanagement and the unreliability of generators in properly identifying the nature of their shipments to Hanford, this report concludes that state regulators must not only re-examine their waste acceptance policy regarding DOE wastes but also stop offsite shipments because DOE cannot reasonably assure the content and safety of the wastes being shipped to Hanford for disposal. More specifically, this report concludes that:

- 1) until Hanford's LLBG are in compliance with Washington's Dangerous Waste Law (leachate collection, monitoring, liners, etc.), and until the LLBG are investigated for apparent contamination of soil and groundwater, and until Offsite Generators can ensure that employees receive the required training for characterizing wastes, etc., the State of Washington should bar additional offsite waste shipments;
- 2) based on Lawrence Berkely National Laboratory's illegal shipment and manifesting of Mixed Wastes (containing hazardous and/or dangerous wastes) as Low-Level Wastes, and on other numerous instances documented in this report, the State of Washington should send Department of Ecology hazardous waste inspectors to conduct on-site inspections of generator Low-Level Waste and Mixed Waste characterization, designation, packaging, manifesting and shipment procedures;
- 3) based on Brookhaven National Laboratory's problems with waste designation, waste traceability, inadequacies in manifesting shipments and poor quality assurance; Paducah Gaseous Diffusion Plant's problems with waste segregation and traceability; Lawrence Berkely National Laboratory's illegal shipment and manifesting of Mixed Wastes (containing hazardous and/or dangerous wastes) as Low-Level Wastes; and the clear trends showing problems with all of DOE's offsite generators, Washington should ban shipments from these offsite generators and exercise its clear legal authority to treat all offsite wastes claimed by DOE to be Low Level Wastes at Hanford, or shipped to Hanford in the future, as Dangerous Wastes;
- 4) based on these documented violations by the offsite generators with designation, characterization, segregation, traceability, manifesting and packaging, the State of Washington should exercise its authority to regulate Dangerous Wastes and impose fines on generators, when they illegally ship or dispose of Dangerous Wastes as Low-Level Wastes - rather than solely imposing penalties on the Hanford site and Hanford contractors;
- 5) based on documentation of inadequate procedures for waste traceability, characterization, designation and packaging, poor employee training practices, the state of Washington should require in the sitewide RCRA permit that the offsite generators provide the full, long-term cost of managing the wastes - ending the practice of the generators paying only approximately 50% of the marginal cost of burying their wastes; and, USDOE should immediately begin to ensure that its offsite generators pay the fully burdened, long-term costs of monitoring wastes shipped to Hanford, and a proportionate share of the ultimate closure costs for burial grounds or storage facilities (Obviously, this would economically incentivize the generators to reduce the wastes they ship to Hanford, while the USDOE decision to ship waste to Hanford is based on NOT minimizing LLW volumes);
- 6) the State of Washington's Department of Ecology must have the financial resources and staff to monitor and inspect generators - Ecology should use its Mixed Waste permit fee authority to charge these costs;

GreenLaw, University of Washington School of Law
Page 34 of 66

7) the State of Washington must start inspecting trucks with DOE radioactive waste at the state border for safety, packaging compliance and proper manifesting - as is currently required for commercial radioactive waste shipments. This can be required as a permit condition, without amending RCW 46.48.200, and WAC 446-50-050.

DOE assessments of nine generator sites, which have produced waste and shipped it to Hanford, including Argonne National Laboratories, Brookhaven National Laboratories, Lawrence Berkely National Laboratories, Fermi National Accelerator Laboratory, KMS/Ann Arbor, Paducah Gaseous Diffusion Plant, Portsmouth Gaseous Diffusion Plant, Princeton Plasma Physics Laboratory, and Rocky Flats Plant illustrate a history of noncompliance with Hanford's own Waste Acceptance Criteria. DOE documents evidence numerous failures to adequately assure the safety of their shipments: to accompany waste shipments with complete and accurate property manifests: to properly package or accurately weigh waste shipments; to ensure the absence of free flowing liquids within the waste shipments; and to properly train or to document proper training for people handling these waste shipments. These problems illustrate a failure by DOE to be able to demonstrate an ability to meet requirements of Washington's Dangerous Waste Law and federal hazardous waste law for characterizing and designating wastes and ensuring that dangerous or hazardous wastes are not illegally disposed of in Hanford's Low-Level Burial Grounds.

While the DOE documents indicate many such compliance failures, it is unlikely that they capture the full magnitude of waste mismanagement at generator sites, since many of the assessments checklists used in DOE assessments are incomplete. This suggests that many waste generator sites do not take the assessments seriously, that the DOE has not been appropriately thorough in conducting the assessments, and that mismanagement is even wider spread than the documents indicate.

Problems at waste generator sites are significant, but constitute only part of the problem with waste shipments to Hanford. Department of Energy, Richland (DOE-RL) is complicit in years of mismanagement of off-site wastes. Hanford has a long history of storing its low level waste in unlined, essentially unmonitored and unregulated trenches, a procedure which has undermined Hanford's safety for years and continues to do so today. Furthermore, although DOE documents indicate that DOE-RL often detected problems with off-site waste before it was accepted at Hanford, they also reveal numerous failures at DOE-RL to identify risks before wastes were buried, and to correct problems when they came to light. The most disturbing example of this tendency was DOE-RL's illegal burial of "Mixed Waste" (waste that is both radioactive and contains either Dangerous Wastes or Hazardous Wastes) in the Low-Level Burial Grounds (LLBG) from 1989-1995, and its failure to correct the mistake when the waste was identified as mixed waste in 1996. **Hanford's LLBG are, therefore, Washington State Dangerous Waste landfills**, subject to Washington State hazardous waste law and administrative code (1.0.1). The Hanford site is currently non-compliant with Washington State law, reason enough to curtail additions of waste to the site.

The overwhelming evidence of problems at DOE waste generator sites and at Hanford should compel Washington State to continue the State's policy of opposing off-site waste imports. Yet, the DOE has issued a Final decision (February 25, 2000) to make Hanford a **National Radioactive Waste Dumpsite**. The decision, is to ship LLW and MW from DOE facilities to two sites, one of which is Hanford. This would greatly increase the total waste buried at Hanford, and the potential contamination sources for groundwater and the Columbia River. As of January 12, 2000, the DOE

GreenLaw, University of Washington School of Law
Page 35 of 66

plan was to ship 105,000 cubic meters of mixed waste and 70,000 cubic meters of low-level waste to Hanford (1.0.2). This would be at least 13 truckloads of waste per week, and 676 truckloads of waste per year (1.0.3). This report, based on a review of documents obtained through the Freedom of Information Act, provides evidence of poor management of such waste in the recent past, and many dangerous mistakes in: characterizing wastes; designating wastes pursuant to Washington hazardous waste law; the lack of treatment and volume reduction; the illegal disposal of hazardous/dangerous mixed wastes in the Low Level Burial grounds; the lack of liners, leachate collection and RCRA compliant groundwater monitoring, groundwater contamination beneath the LLBG; the illegal failure by USDOE to have a closure and monitoring plan for the LLBG; the inability of generator sites to properly manifest and track the source and amounts of wastes sent to Hanford; in training problems identified for generator sites sending wastes; packaging violations...

Based on documents discovered through the Freedom of Information Act, the following report, organized by site, establishes DOE's history of LLW mismanagement and the likelihood that the shipment of additional waste will endanger the health of Washington State's environment and its inhabitants.

Document available in full at www.heartofamericanorthwest.org

GreenLaw, University of Washington School of Law
Page 36 of 66

Standards of Seismic Safety for Existing Federally Owned and Leased Buildings.

BFRL ICON

Standards of Seismic Safety for Existing Federally Owned and Leased Buildings.
(9537 K)

Cauffman, S. A.; Lew, H. S.

NISTIR 6762; 27 p. January 2002.

Available from:

National Technical Information Service (NTIS), Technology Administration, U.S. Department of Commerce, Springfield, VA 22161.

Telephone: 1-800-553-6847 or 703-605-6000;

Fax: 703-605-6900; Rush Service (Telephone Orders Only) 800-553-6847;

Website: <http://www.ntis.gov>

Order number: PB2002-102211

Keywords:

seismic; safety; federal buildings; evaluation; rehabilitation

Abstract:

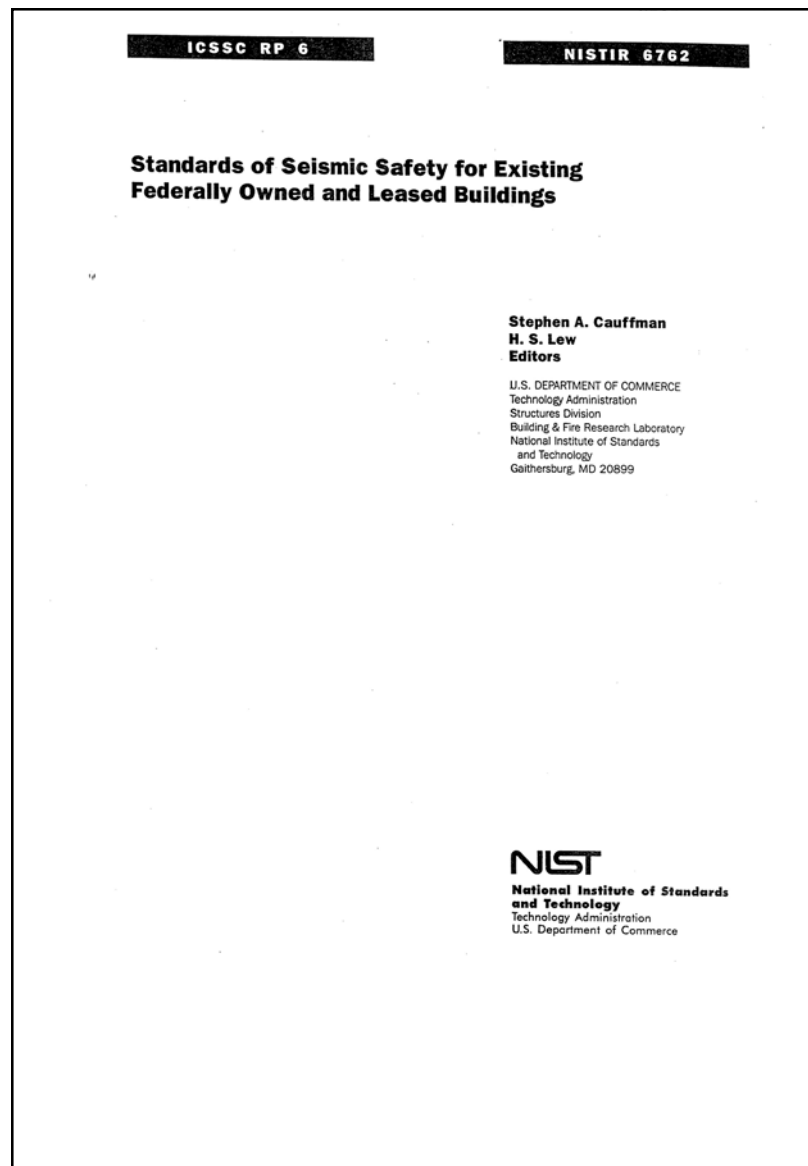
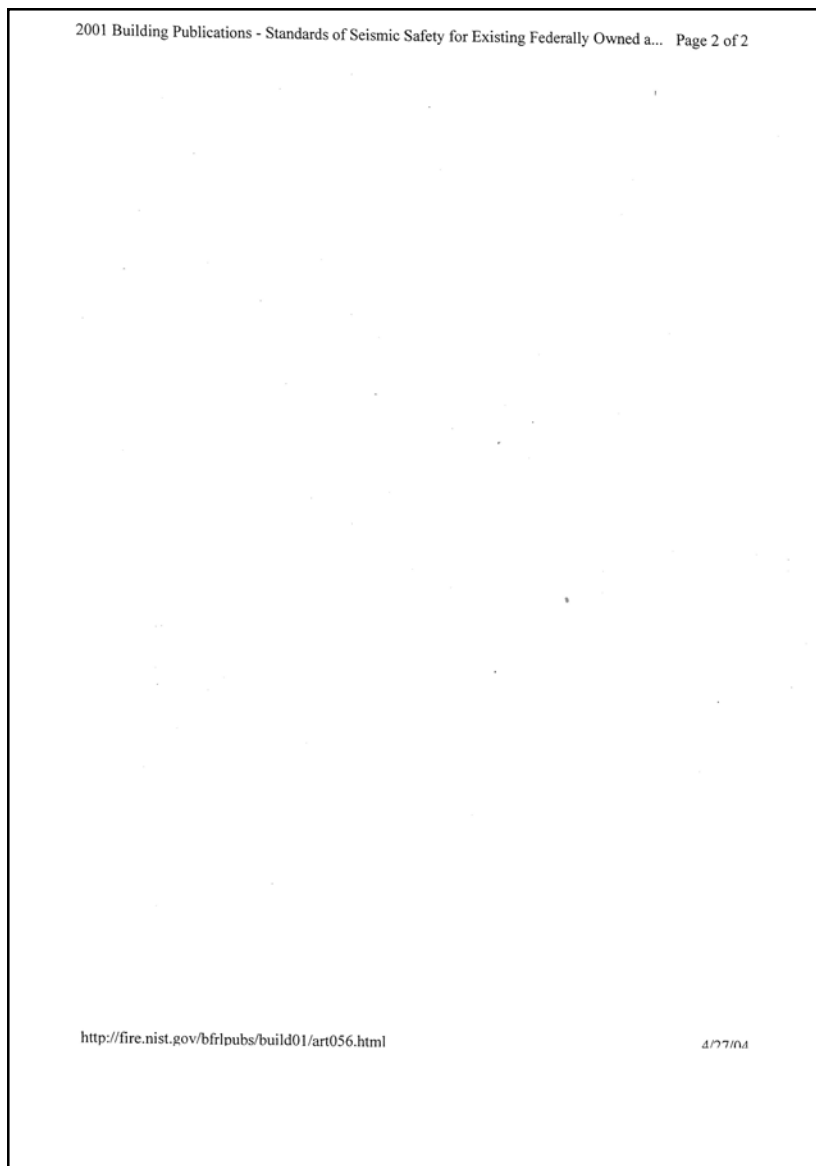
The seismic safety evaluation and mitigation standards, Standards for Seismic Safety for Existing Federally Owned and Leased Buildings, were developed for use by the Federal Government by the Interagency Committee on Seismic Safety in Construction (ICSSC) in conjunction with the National Institute of Standards and Technology (NIST) and with the funding support of several ICSSC member agencies. The intent of this document is to provide Federal agencies with minimum and extended standards for the evaluation and mitigation of seismic hazards in their building inventories. This document responds to Executive Order 12941 Sec. 4, which directs the ICSSC to "...update the Standards at least every 5 years," and to "...update the Standards within 2 years of the publication of the First Edition of FEMA's guidelines for Seismic Rehabilitation of Buildings and Commentary." Life-Safety is defined as the minimum acceptable performance objective for Federal buildings. This document further provides for an extended level of performance, Immediate Occupancy, where required to meet agency mission. FEMA 310, Handbook for the Seismic Evaluation of Buildings - A Prestandard, and FEMA 356, Prestandard and Commentary for the Seismic Rehabilitation of Buildings, provide the basis for defining these performance objectives and evaluation criteria. Situations requiring an evaluation and if necessary, mitigation, are identified. The Standards and Commentary include: an identification of situations that trigger application of the Standards, preliminary and detailed evaluation procedures, and mitigation requirements for the two performance objectives, Life-Safety and Immediate Occupancy.

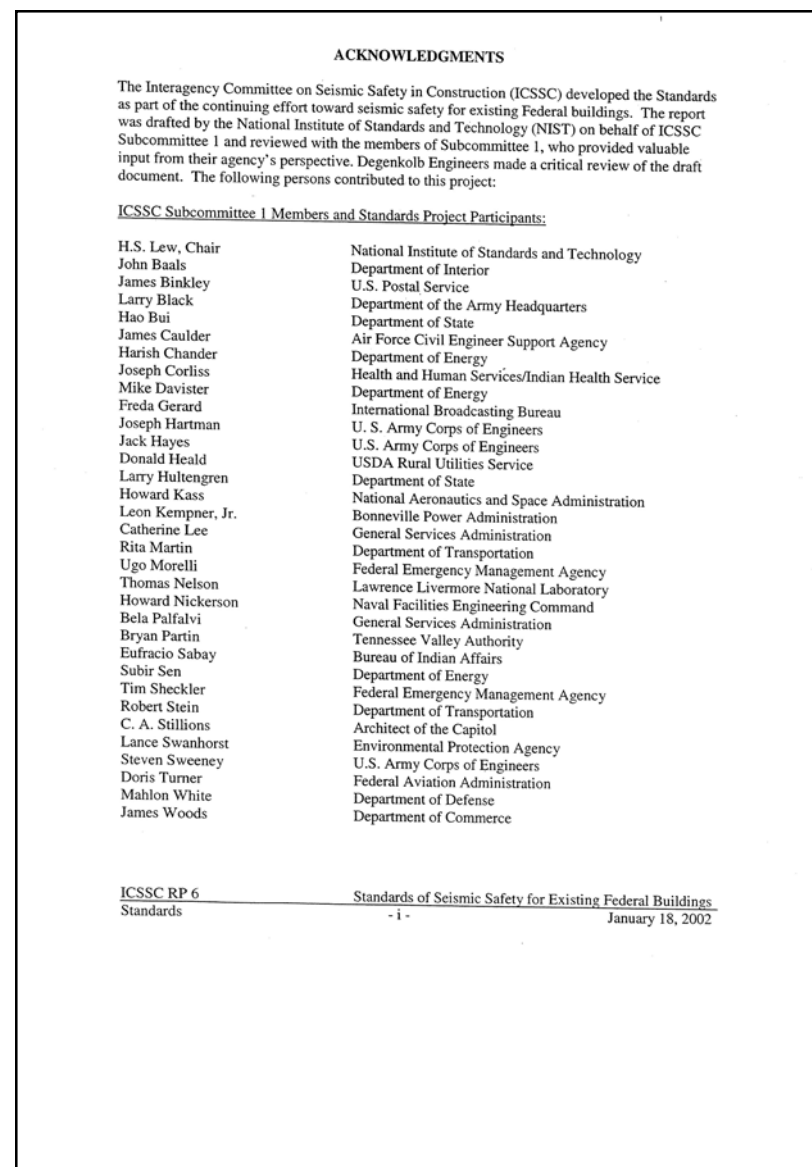
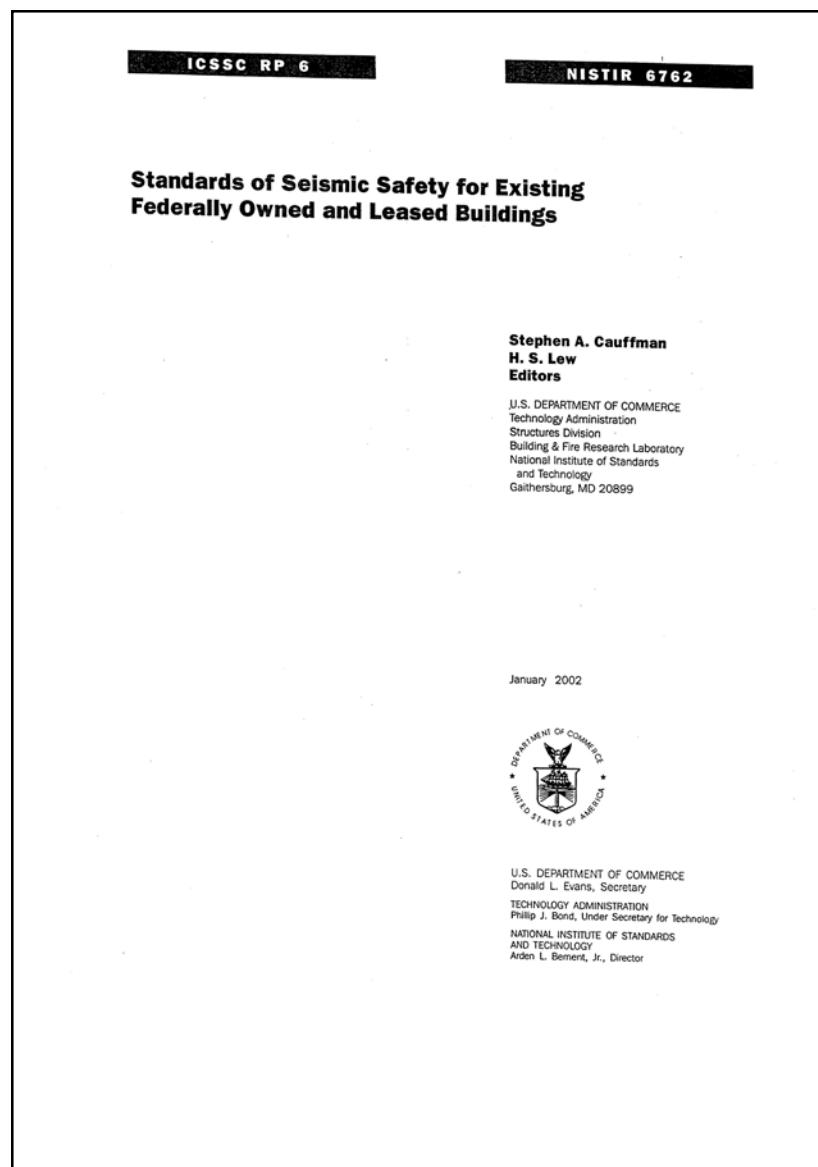
*Building and Fire Research Laboratory
National Institute of Standards and Technology
Gaithersburg, MD 20899*

<http://fire.nist.gov/bfrlpubs/buil401/ast056.html>

GreenLaw, University of Washington School of Law
Page 37 of 66

GreenLaw, University of Washington School of Law
Page 38 of 66





GreenLaw, University of Washington School of Law
Page 41 of 66

ICSSC Technical Secretariat

Stephen Cauffman

Degenkolb Engineers

John Dal Pino
Chris Poland

ICSSC RP 6 Standards of Seismic Safety for Existing Federal Buildings
Standards - ii - January 18, 2002

GreenLaw, University of Washington School of Law
Page 42 of 66

PREFACE

In response to Public Law 101-614, the *Standards of Seismic Safety for Existing Federally Owned or Leased Buildings and Commentary (RP 4)* was issued by the Interagency Committee on Seismic Safety in Construction (ICSSC) in 1994. Pursuant to Executive Order 12941, the *Standards* are periodically updated to incorporate advanced knowledge in earthquake engineering gained from research and from observed performance of structures in recent earthquakes. This document, *Standards of Seismic Safety for Federally Owned and Leased Buildings (RP 6)*, is the revision to the *Standards of Seismic Safety for Owned or Leased Buildings and Commentary (RP 4)*.

The intent of the Standards is to identify common minimum evaluation and mitigation measures for all Federal departments and agencies, and to ensure that all federal entities have a balanced, agency-conceived and controlled seismic safety program for their existing owned or leased buildings.

Since the issuance of *RP 4*, the Federal Emergency Management Agency (FEMA) has published a number of documents related to evaluation and rehabilitation of existing buildings. The *Handbook for the Seismic Evaluation of Buildings – A Prestandard (FEMA 310)*, supersedes the *NEHRP Handbook for the Seismic Evaluation of Existing Buildings (FEMA 178)*. The *Prestandard and Commentary for the Seismic Rehabilitation of Buildings (FEMA 356)* now provides guidance for seismic rehabilitation of buildings. Under the auspices of FEMA, standards for seismic evaluation and rehabilitation are being developed by the American Society of Civil Engineers (ASCE) based on FEMA 310 and FEMA 356. These documents are referenced and cited throughout the standards (RP 6) and as they become available, they will be incorporated into RP 6.

ICSSC RP 6 Standards of Seismic Safety for Existing Federal Buildings
Standards - iii - January 18, 2002

ABSTRACT

The seismic safety evaluation and mitigation standards, *Standards of Seismic Safety for Existing Federally Owned and Leased Buildings*, were developed for use by the Federal Government by the Interagency Committee on Seismic Safety in Construction (ICSSC) in conjunction with the National Institute of Standards and Technology (NIST) and with the funding support of several ICSSC member agencies. The intent of this document is to provide Federal agencies with minimum (Life-Safety) and extended (Immediate Occupancy) standards for the evaluation and mitigation of seismic risks in their building inventories. This document responds to Executive Order 12941 Sec. 4, which directs the ICSSC to "...update the Standards at least every 5 years," and to "...update the Standards within 2 years of the publication of the First Edition of FEMA's *Guidelines for Seismic Rehabilitation of Buildings and Commentary*" (FEMA 273).

Life-Safety is the minimum acceptable performance objective for Federal buildings. This document further provides for an extended level of performance, Immediate Occupancy, where required to meet agency mission. FEMA 310, *Handbook for the Seismic Evaluation of Buildings - A Prestandard*, and FEMA 356, *Prestandard and Commentary for the Seismic Rehabilitation of Buildings*, provide the basis for defining these performance objectives, evaluation, and if necessary, mitigation criteria.

The Standards and Commentary include: an identification of situations that trigger application of the Standards, preliminary and detailed evaluation procedures, and mitigation requirements for the two performance levels, Life-Safety and Immediate Occupancy.

TABLE OF CONTENTS

ACKNOWLEDGMENTS.....	i
PREFACE.....	iii
ABSTRACT.....	iv
TABLE OF CONTENTS.....	v
STANDARDS.....	1
1.0 INTRODUCTION.....	1
1.1 Objectives.....	2
1.1.1 Seismic Rehabilitation Objectives.....	2
1.1.2 Additional Objectives.....	3
1.2 Scope - Compliance Categories.....	4
1.2.1 Items Not Included in the <i>Standards</i>	5
1.3 Scope - Buildings.....	5
1.3.1 Benchmark Buildings.....	7
1.3.2 Leased Buildings.....	8
1.3.3 Privately-Owned Buildings on Federal Land.....	9
2.0 APPLICATION OF THE STANDARDS.....	10
2.1 Situations Requiring Evaluation and Mitigation.....	10
2.2 Compliance.....	11
2.3 Qualifications of Evaluators, Designers, and Reviewers.....	11
2.4 Additional Requirements.....	12
3.0 EVALUATION.....	14
3.1 Evaluation Requirements.....	15
4.0 MITIGATION.....	16
4.1 Requirements.....	16
4.2 Minimum Standards and Scope for Rehabilitation.....	16
4.3 Incremental/Partial Rehabilitation.....	16
4.4 Local Modification of Components.....	17
4.5 Removal or Lessening of Existing Irregularities.....	17
4.6 Innovative Mitigation Methods.....	17
4.7 Historic Buildings.....	18
REFERENCES.....	19

STANDARDS

1.0 INTRODUCTION

The intent of the *Standards of Seismic Safety for Federally Owned and Leased Buildings* (hereinafter referred to as the *Standards*) is to provide Federal agencies with common minimum and higher standards for the evaluation and mitigation of seismic risks in their owned or leased buildings, and privately owned buildings on Federal land to ensure that all agencies have a balanced, agency-conceived and controlled seismic safety program. The *Standards* allow for two levels of seismic performance: a minimum Life-Safety level intended to provide a low risk of earthquake induced life safety endangerment and a higher Immediate Occupancy level, intended to minimize the risk of earthquake-induced impairment of mission, recommended for critical facilities. The *Standards* build upon previous efforts by the Interagency Committee on Seismic Safety in Construction (ICSSC) in support of the National Earthquake Hazards Reduction Program (NEHRP). This document supersedes the Interagency Committee on Seismic Safety in Construction's *Standards of Seismic Safety for Existing Federally Owned or Leased Buildings and Commentary* (RP 4).

The *Standards* consist of this Introduction and three additional sections as follows:

The **Application of the Standards** section identifies situations that trigger the application of the *Standards*, defines compliance with the *Standards*, and identifies additional measures that must be included in each agency's seismic safety responsibilities for existing buildings.

The **Evaluation Requirements** of the *Standards* identifies building data required before conducting a building evaluation and provides guidance on the application of FEMA 310 and FEMA 356 based on building type and other factors.

The **Mitigation Requirements** section of the *Standards* includes the requirements for mitigation of seismic risks; standards for rehabilitation of structural, non-structural, foundation/geologic/site, and adjacency hazards; guidance on incremental or partial rehabilitation; alternative mitigation methods; and rehabilitation of historic buildings based on FEMA 356.

C1 INTRODUCTION:

RP 4, published in 1994, was based upon FEMA 178, *NEHRP Handbook for the Seismic Evaluation of Existing Buildings*, which established the criteria for evaluating buildings to a performance level of Substantial Life-Safety. Since the publication of RP 4, several new documents have been published that have made RP 4 obsolete. The 1997 *NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures Parts 1 and 2* (FEMA 302 and 303) introduced new seismic hazard maps that better defined the risk of damaging ground shaking across the United States. These design maps were based on probabilistic seismic hazard maps produced by the U.S. Geological Survey. The maps provide median values of 5 % damped spectral accelerations at two periods (0.2 sec and 1.0 sec) for Site

ICSSC RP 6
Standards

Standards of Seismic Safety for Existing Federal Buildings
- 1 -
January 18, 2002

Class B (FEMA 302), with a 2 % exceedance probability in 50 years (return period of about 2500 years). Prior to the 1997 NEHRP Recommended Provisions, ground shaking intensity was characterized by effective peak response acceleration, A_R , and effective peak velocity-related response acceleration, A_V . These values were derived from maps developed by Algermissen and Perkins for shaking with a 10 % exceedance probability in 50 years (return period of about 500 years) on rock sites.

In 1997, FEMA 273, *NEHRP Guidelines for the Seismic Rehabilitation of Buildings* and FEMA 274, *NEHRP Commentary on the Guidelines for the Seismic Rehabilitation of Buildings* were published. A prestandard based upon these documents was issued in November 2000 as *Prestandard and Commentary for the Seismic Rehabilitation of Buildings* (FEMA 356) and is accompanied by a resource document entitled, *Global Topics Report on the Prestandard and Commentary for the Seismic Rehabilitation of Buildings* (FEMA 357). FEMA 310, *Handbook for the Seismic Evaluation of Buildings, A Prestandard*, was published in 1998. (It will soon be published by the American Society of Civil Engineers as the ASCE 31 standard.) While FEMA 178 dealt only with the life-safety risk, FEMA 310 and FEMA 356 include procedures for evaluation and rehabilitation of buildings for Life-Safety and Immediate Occupancy performance levels.

1.1 Objectives

The primary objective of the *Standards* is to reduce the life-safety risk to occupants of Federal buildings and to the public. Life-Safety is the minimum performance level appropriate for Federal buildings. In addition, the *Standards* provide for a higher level of performance, commonly referred to as Immediate Occupancy, when needed to meet agency mission requirements. Both levels of performance are defined in Section 1.1.1 below.

C1.1 Objectives:

RP 4 established Substantial Life-Safety as the minimum performance level for Federally owned and leased buildings. Executive Order 12941 directed Federal agencies to adopt RP 4 for use in assessing the seismic safety of their owned and leased buildings and in mitigating seismic risks in those buildings. Recent earthquakes have clearly identified the importance of immediate use of critical facilities after an earthquake. Recognizing this need, FEMA 310 provides for evaluation to a higher level of performance, Immediate Occupancy, in addition to Life-Safety.

The *Standards* are not intended for use in judging the adequacy of past good-faith agency efforts at evaluation and mitigation; they are intended to establish appropriate minimums for actions taken after the *Standards* are formally adopted by the ICSSC.

1.1.1 Seismic Rehabilitation Objectives

FEMA 310 defines the Life-Safety and Immediate Occupancy Performance Levels as follows:

Life-Safety Level: Building performance that includes significant damage to both structural and nonstructural components during the design earthquake, though at least some margin against

ICSSC RP 6
Standards

Standards of Seismic Safety for Existing Federal Buildings
- 2 -
January 18, 2002

GreenLaw, University of Washington School of Law
Page 47 of 66

either partial or total structural collapse remains. Injuries may occur, but the level of risk for life-threatening injury and entrapment is low. People will likely be unable to reoccupy the building for continuous use until structural repairs are completed.

Immediate Occupancy Level: Building performance that includes very limited damage to both structural and nonstructural components during the design earthquake. The basic vertical and lateral-force-resisting systems retain nearly all of their pre-earthquake strength and stiffness. The level of risk for life-threatening injury as a result of damage is very low. Although some minor repairs may be necessary, the building can be fully occupied after a design earthquake, and the needed repairs may be completed while the building is occupied.

In addition to these performance levels, FEMA 356 defines the Damage Control Structural Performance Range as the continuous range of damage states between the Life Safety Structural Performance Level and the Immediate Occupancy Structural Performance Level. Design for performance within the Damage Control Structural Performance Range may be desirable to minimize repair time and operation interruption, to protect valuable equipment or contents, or to preserve important historic features when the cost of design for Immediate Occupancy is excessive.

1.1.2 Additional Objectives

Federal agencies may pursue more stringent standards than Life-Safety for those buildings where a higher performance level is necessary to control damage or maintain post-earthquake operation for mission readiness. The *Standards* provide for evaluation and mitigation of seismic risks in Federal buildings to a performance level of Immediate Occupancy where this higher level of performance is needed. Buildings that must remain fully functional during an earthquake and afterwards (Operational Level) are beyond the scope of the *Standards* and must be evaluated using appropriate, agency specific criteria.

CI.1.2 Additional Objectives

Some Federal agencies own or lease buildings that house facilities that are considered essential or mission critical and should be evaluated to the Immediate Occupancy performance level. The definition of what is "essential" or "mission critical" needs to be determined by each individual agency. As a guide, Section 1.3.1 of the 2000 Edition, *NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures* (FEMA 368) defines the following buildings as essential facilities:

- Fire or rescue and police stations,
- Hospitals,
- Designated medical facilities having emergency treatment facilities,
- Designated emergency preparedness centers
- Designated emergency operation centers
- Designated emergency shelters
- Power generating stations or other utilities required as emergency back-up facilities for Seismic Use Group III (essential facilities)

ICSSC RP 6
Standards

Standards of Seismic Safety for Existing Federal Buildings
- 3 -
January 18, 2002

GreenLaw, University of Washington School of Law
Page 48 of 66

- Emergency vehicle garages and emergency aircraft hangars
- Designated communication centers
- Aviation control towers and air traffic control centers
- Structures containing sufficient quantities of toxic or explosive substances deemed to be hazardous to the public
- Water treatment facilities required to maintain water pressure for fire suppression

The *Standards* provide tools for evaluating buildings to the Immediate Occupancy performance level. Agencies may, at their discretion, designate buildings other than those listed above to have a performance level of Immediate Occupancy. Levels of performance higher than Immediate Occupancy require consideration of all critical building systems and the availability of utilities. Such consideration is beyond the scope of the *Standards*.

1.2 Scope – Compliance Categories

The *Standards* address the potential vulnerability of Federal buildings to all significant seismic risks, which are grouped into four compliance categories:

- Structural,
- Nonstructural,
- Foundation,
- Geologic Site, and
- Adjacency.

The basis for evaluation of buildings within the United States (the fifty states and territories) shall be the Maximum Considered Earthquake (MCE) shaking values obtained from the seismic hazard maps, modified to account for Site Class effects and reduced by a factor of 2/3 as found in FEMA 310. The MCE maps show values of 5 % damped, spectral response accelerations with a 2% chance of exceedance in 50 years, except at some sites in highly active seismic regions, where MCE shaking contours are based on maximum magnitude earthquakes on the known faults in the region. As an alternative to using mapped values of MCE shaking demands, site-specific MCE seismic hazards defined using the site-specific procedure described in the 2000 *NEHRP Provisions*, incorporating detailed information about a particular site's geology and seismicity, may also be used.

CI.2 Scope – Compliance Categories

The compliance categories identified – structural, nonstructural, foundation, geologic site, and adjacency – are convenient groupings of sources of potential life-safety risks. Elements of all are included within the scope of FEMA 310. The adjacency category often will directly involve property not owned by the government and may therefore require legal or administrative intervention, rather than engineering solutions.

The seismic maps accompanying the 2000 *NEHRP Recommended Provisions* and referenced in the *Standards* represent the varying levels of seismic hazard for all areas in the United States.

ICSSC RP 6
Standards

Standards of Seismic Safety for Existing Federal Buildings
- 4 -
January 18, 2002

GreenLaw, University of Washington School of Law
Page 49 of 66

These maps should be used by agencies along with site-specific studies (where appropriate) to establish the seismicity of a site.

1.2.1 Items Not Included in the Standards

The Standards do not include means to evaluate or mitigate the effects of:

- flooding,
- fire,
- wind,
- blast, or
- volcanic activity.

The Standards also do not address criteria for:

- repair of damaged or deteriorated buildings, including damage caused by previous earthquakes,
- preparation of post-earthquake preparedness plans, or
- seismic instrumentation of Federal buildings.

C1.2.1 Items Not Included in the Standards

Although there are obvious interactions between seismic hazards and other natural or manmade threats to buildings, a multi-hazard approach is beyond the scope of this document. However, before mitigation measures are taken for seismic deficiencies, it is strongly suggested that other potential hazards, particularly wind and blast, be considered. It is beyond the scope of these Standards to address evaluation and mitigation criteria for damaged or deteriorated buildings, including those buildings damaged by earthquakes. However, any agency conducting an evaluation of a building damaged by any cause must investigate the condition of both the vertical and lateral-force-resisting elements to ensure that these elements can perform dependably during an earthquake.

Seismic instrumentation of Federal buildings is not addressed by the Standards. Agencies should be encouraged to instrument a sample number of Federal buildings to record their responses during seismic events in order to validate and/or improve their expected performance.

1.3 Scope – Buildings

Except for buildings that require a seismic performance level beyond Life-Safety or Immediate Occupancy because of agency mission requirements, the following buildings are exempt from the Standards:

- a. all buildings located in regions of low seismicity where $S_{DS} < 0.167$ g, and $S_{D1} < 0.067$ g (unless designated by agency as a critical facility),
- b. detached one- and two-family dwellings located where $S_{DS} < 0.4$ g,

ICSSC RP 6 Standards of Seismic Safety for Existing Federal Buildings
Standards - 5 - January 18, 2002

GreenLaw, University of Washington School of Law
Page 50 of 66

- c. detached one- and two-family wood frame dwellings located where $S_{DS} \geq 0.4$ g that satisfy the light-frame construction requirements of the 2000 NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures,
- d. agricultural and storage structures that are intended only for incidental human occupancy or that are occupied by persons for a total of less than 2 hours a day,
- e. one story buildings of steel light frame or wood construction with areas less than 280 m² (3000 ft²),
- f. special structures including, but not limited to: bridges, transmission towers, industrial towers and equipment, piers and wharves, and hydraulic structures,
- g. fully rehabilitated buildings that comply with these Standards, to the satisfaction of the owning agency, in all compliance categories (structural, nonstructural, foundation, geologic site hazards, and adjacency),
- h. post-benchmark buildings as defined in Table 1-1 which also comply with the structural, nonstructural, foundation, geologic site hazards, and adjacency compliance categories and are being evaluated to the Life-Safety Performance Level,
- i. pre-benchmark buildings which have been shown by evaluation to the satisfaction of the owning agency to be life-safe in all four compliance categories,
- j. buildings constructed for the Federal Government whose detailed design was done after the date of adoption of Executive Order 12699 (January 5, 1990) and that were designed and constructed in accordance with the ICSSC Guidelines and Procedures for Implementation of the Executive Order on Seismic Safety of New Building Construction, RP 2.1-A,
- k. buildings scheduled for demolition; temporary short-term leases; and foreclosure buildings,
- l. the remaining useful life of the building or the agency's requirement for the building has been identified as being less than five years,
- m. rehabilitated buildings that substantially comply with RP 4, or other agency specific standards and criteria to the satisfaction of the owning agency, in all four compliance categories (structural, nonstructural, foundation, geologic site hazards, and adjacency).

C1.3 Scope - Buildings

Buildings that require higher performance than Life-Safety should be identified as such prior to their elimination as exempted buildings to assure that they are given adequate consideration. Also, performance expectations for recently constructed buildings should be compared with their required objectives. Benchmark years, suggested in Table 1-1 of the Standards (Section 1.3.1), may not be applicable to the higher performance objectives.

The list of buildings that need not meet the Standards – either because they are unlikely to present a significant life-safety risk or because they do not fit within the boundaries commonly placed on building standards and technology – was developed considering the extent of application of FEMA 310, and previous exemptions listed in the Standards of Seismic Safety for Existing Federally Owned or Leased Buildings and Commentary, RP 4, that are still valid.

ICSSC RP 6 Standards of Seismic Safety for Existing Federal Buildings
Standards - 6 - January 18, 2002

GreenLaw, University of Washington School of Law
Page 51 of 66

Item a. is based upon the recommendation by the ICSSC to exempt Federal buildings in regions of low seismicity. Agencies may, at their discretion, choose to apply higher performance levels to buildings located in areas where $S_{pg} < 0.167$ g and $S_{pi} < 0.067$ g to meet mission requirements. Item b, c, and d are based directly on the extent of application of FEMA 310. FEMA 310 does not automatically exempt any class of buildings, however, based on the exemptions contained in codes for new buildings, agencies may elect to exempt these classes of construction. Items e, g, h, and i have been retained from RP 4.

1.3.1 Benchmark Buildings

A benchmark building is one that was designed and built in accordance with adequate seismic provisions, which are considered to provide acceptable life-safety protection. The determination of benchmark years is complex and varies with building location, age, structural system, and governing building code. A table of benchmark years is provided in Table 1-1. Note that if the seismicity of a region has changed since the benchmark dates listed in Table 1-1, a building must have been designed and constructed or evaluated in accordance with the current seismicity of the region to be compliant with the *Standards*. Only buildings designed and constructed in accordance with the documents listed in Table 1-1 and being evaluated to the Life-Safety Performance Level may be considered Benchmark Buildings.

Table 1-1: Benchmark Buildings

Building Type ^{1,2}	Model Building Seismic Design Provisions			
	BOCA	SBCCI	UBC	NEHRP
Wood Frame, Wood Shear Panels (Type W1 & W2)	1993	1994	1976	1985
Wood Frame, Wood Shear Panels (Type W1A)	1993	1994	1976	1985
Steel Moment Resisting Frame (Type S1 & S1A)	*	*	1994 ³	**
Steel Braced Frame (Type S2 & S2A)	1993	1994	1988 ⁵	1991
Light Metal Frame (Type S3)	*	*	*	*
Steel Frame w/ Concrete Shear Walls (Type S4)	1993	1994	1976	1985
Reinforced Concrete Moment Resisting Frame (Type C1) ³	1993	1994	1976	1985
Reinforced Concrete Shear Walls (Type C2 & C2A)	1993	1994	1976	1985
Steel Frame with URM Infill (Type S5, S5A)	*	*	*	*
Concrete Frame with URM Infill (Type C3 & C3A)	*	*	*	*
Tilt-up Concrete (Type PC1 & PC1A)	*	*	*	*
Precast Concrete Frame (Type PC2 & PC2A)	*	*	*	*
Reinforced Masonry (Type RM 1)	*	*	1997	*
Reinforced Masonry (Type RM 2)	1993	1994	1976	1985
Unreinforced Masonry (Type URM) ⁶	*	*	1991 ⁷	*
Unreinforced Masonry (Type URMA)	*	*	*	*

¹Building Type refers to one of the Common Building Types defined in FEMA 310, Table 2-2 (p. 2-6 through 2-10).

²Buildings on hillside sites shall not be considered Benchmark Buildings.

³Flat Slab Moment Resisting Frame Buildings shall not be considered Benchmark Buildings.

⁴Steel Moment-Resisting Frame Connections shall comply with the 1994 UBC Emergency Provisions, the 1997 UBC, the 1997 AISC Seismic Provisions, the 2000 IBC or FEMA 350; or the analytical evaluation provisions of FEMA 351.

GreenLaw, University of Washington School of Law
Page 52 of 66

⁵Buildings with thin-walled steel tubes in braced frames shall not be considered Benchmark Buildings.

⁶URM buildings evaluated using the ABK Methodology (ABK, 1984) may be considered benchmark buildings.

⁷Refers to the UBCB.

*No benchmark year; buildings shall be evaluated using the *Standards*.

**Local provisions shall be compared with the UBC.

BOCA – Building Officials and Code Administrators, *National Building Code*.

SBCCI – Southern Building Code Congress International, *Standard Building Code*.

UBC – International Conference of Building Code Officials, *Uniform Building Code*.

NEHRP – Federal Emergency Management Agency, *NEHRP Recommended Provisions for the Development of Seismic Regulations for New Buildings and Other Structures*.

UCBC – Uniform Code for Building Conservation

Note: Table adapted from fourth ballot version of ASCE Draft Standard for Seismic Evaluation of Existing Buildings.

C1.3.1 Benchmark Buildings

The establishment of benchmark years that will automatically qualify buildings as being structurally adequate is complex. The designation of benchmark years changes to reflect new knowledge gained from studying the performance of buildings in seismic events, from new research results, and other relevant information. Table 1-1 reflects the benchmark years adopted by the ICSSC for Federal Buildings. Benchmark years for any previously used seismic provisions can be established by comparing resulting designs by building types with the acceptance standards. Care must be taken in such comparisons to consider all possible variations of the building type studied.

1.3.2 Leased Buildings

The *Standards* shall apply to all or portions of non-Federally owned buildings leased by the Federal Government, unless exempt under the provisions of Section 1.3

The following provisions shall also apply:

- No new leases or lease renewals/extensions shall be made in buildings that do not comply with the *Standards*.

Exception: If no seismically conforming space is available, otherwise acceptable space with the best seismic resistance shall be pursued.

- The building owner shall obtain certification by a registered professional engineer that the building conforms to the *Standards*.

GreenLaw, University of Washington School of Law
Page 53 of 66

C1.3.2 Leased Buildings

Non-federally owned buildings in which the Federal Government leases space are subject to the *Standards*, unless exempt per Section 1.3. RP 4 provided an exception that allowed agencies to continue leasing space in non-conforming buildings if no other conforming space was available.

1.3.3 Privately-Owned Buildings on Federal Land

The *Standards* shall be applied to all privately owned buildings located on Federal land. Application of the *Standards* to evaluation and rehabilitation of seismic risks shall be the responsibility of the building owner.

C1.3.3 Privately-Owned Buildings on Federal Land

Privately-owned buildings on Federal land, such as concessionaire buildings in National Parks, schools on military bases, and buildings constructed and owned by private contractors with long-term exclusive relationships with Federal agencies, were exempted by RP 4. However, the ICSSC has recommended that these buildings be evaluated and that unacceptable seismic risks be mitigated. As a result, the *Standards* shall apply to all privately owned buildings located on Federal land.

GreenLaw, University of Washington School of Law
Page 54 of 66

2.0 APPLICATION OF THE STANDARDS

This section defines those situations that trigger a seismic evaluation and rehabilitation of a Federal building.

2.1 Situations Requiring Evaluation and Mitigation

At a minimum, a building shall be evaluated and unacceptable risks mitigated when any of the following occur:

- a change in the building's function which results in a significant increase in the building's level of use, importance, or occupancy, as determined by the agency,
- a project is planned which significantly extends the building's useful life through alterations or repairs which total more than 30 % of the replacement value of the facility,
- the building or part of the building has been damaged by fire, wind, earthquake, or other cause to the extent that, in the judgement of the agency, significant structural degradation of the building's vertical or lateral load carrying systems has occurred,
- the building is deemed by the agency to be an exceptionally high risk to occupants or the public at large, or
- the building is added to the Federal inventory through purchase or donation after adoption of the *Standards*.

C2.1 Situations Requiring Evaluation and Mitigation

Seismic risk mitigation programs consist of both "active" and "passive" components. "Active" components of a seismic risk mitigation program specifically require some action to be taken, such as inventory, evaluation, planning for rehabilitation, and rehabilitation of buildings.

The focus of the "passive" components or "triggers" is on changes to the building which increase its life or value or will increase the risk level of the building, such as a change in occupancy. The philosophy of the use of triggers is to achieve safety similar to a new building when renovating an old building. Such triggers also serve to gradually reduce the overall seismic risk presented by the existing building stock. Since such triggered improvements will be done concurrently with significant non-seismic work, the cost and disruption attributable to the seismic rehabilitation is minimized.

In the private sector, strict enforcement of such triggers has also served to effectively limit improvements to the existing building stock and at times has encouraged careful planning to avoid the triggers.

The basic triggers listed in this section encourage consistent application of the "renovation" philosophy discussed above. Because of the efficiency of combining seismic rehabilitation with other work, additional triggers may be advantageous for each agency considering characteristics of its own program.

The definition of the term "exceptionally high risk" varies from agency to agency but is based upon consideration of one or more of the following factors: (1) seismicity of the building site,

GreenLaw, University of Washington School of Law
Page 55 of 66

(2) structural system, (3) number of occupants, (4) date of construction, (5) number of stories, (6) occupancy type, (7) size (area), (8) structural irregularities, (9) unusual building geometry or characteristics, and (10) importance of building to agency mission.

A building presenting an "exceptionally high risk" may be discovered at any time, either in a systematic evaluation process, or by review of the building for other purposes. A plan to reduce such high risks should be developed immediately. One or more of the mitigation measures listed in Section 4.1 should be considered.

Item e. is intended to prevent unsafe buildings from being permanently added to the Federal inventory, by triggering a seismic evaluation and if necessary, mitigation, when they are acquired. It is not intended to apply to buildings temporarily under Federal ownership, such as those in the assets of failed banks placed under Federal guardianship. Newly leased buildings are covered in Section 1.3.2.

2.2 Compliance

A building is considered to be in compliance with the *Standards* if the building is:

- exempt from the *Standards* in accordance with Section 1.3,
- determined by evaluation to be in compliance with the *Standards* in accordance with Section 3.0, or
- unacceptable seismic risks have been mitigated in accordance with Section 4.0.

Compliance with the *Standards* should result in a minimum performance level of Life-Safety. The *Standards* also provide for the evaluation of buildings and mitigation of seismic risks to meet the higher performance level of Immediate Occupancy where this level of performance is required to meet the agency's mission.

2.3 Qualifications of Evaluators, Designers, and Reviewers

In general, all evaluation, development of mitigation approaches, and design of rehabilitation work shall be prepared by a registered professional engineer with experience in the type of work being considered. For independent peer reviews of alternative or innovative evaluation methods, analysis techniques or rehabilitation concepts required by the *Standards*, an individual highly qualified in the field of earthquake engineering or a panel of such individuals should be selected by the agency. Tier 2 and Tier 3 evaluations in accordance with FEMA 310 of potential foundation deficiencies, and geologic site hazards should be conducted by a geotechnical engineer or engineering geologist qualified to perform the work by registration and/or experience.

C2.3 Qualifications of Evaluators, Designers, and Reviewers

Registered engineers should be used to evaluate seismic risks for each of the four compliance categories for a specific building and to plan rehabilitation schemes necessary for mitigation. The experience and qualifications of the individuals should match the scope and complexity of

ICSSC RP 6 Standards of Seismic Safety for Existing Federal Buildings
Standards - 11 - January 18, 2002

GreenLaw, University of Washington School of Law
Page 56 of 66

the assignment. Registration as a Professional Engineer is intended to ensure that an individual possesses at least a familiarity with design and analysis of buildings for lateral loads. In addition, training and experience in seismic investigations should be required.

Those with a minimum amount of such background experience may be qualified for relatively small and simple buildings. Highly qualified individuals may be required for complex buildings or for peer review. Such persons will likely have academic credentials far beyond the bachelor level with courses in structural dynamics, inelastic analysis, and other topics in advanced earthquake engineering. They may have published technical articles on seismic issues of existing structures or be active in related professional organizations. Their project experience should relate specifically to seismic investigations of structures. They should be capable of providing personal references attesting to their successful completion of projects similar to that contemplated by the agency.

A specialist in geology or geotechnical engineering should be used for evaluation of foundation deficiencies and geologic site hazards.

2.4 Additional Requirements

As part of each agency's seismic safety responsibilities for existing buildings, the following measures shall be implemented as appropriate:

- development of standards for seismic performance levels higher than Life-Safety and Immediate Occupancy if necessary to carry out agency mission,
- development and dissemination of agency-specific policies consistent with all provisions of the *Standards*,
- assurance that consistent measures of quality control are included in such policies and applied to all phases of evaluation, design, and construction, in a manner consistent with FEMA 310 and FEMA 356, and
- assurance that agency-specific standards and procedures for evaluation and mitigation of hazards are substantially equivalent to or more stringent than FEMA 310 and FEMA 356 or successor documents adopted by the ICSSC.

C2.4 Additional Requirements

Item c., quality control, cannot be overlooked in a seismic hazard mitigation project. All phases of a project, including evaluation, design, and construction, must be monitored and evaluated to be successful. Guidance from documents like the *Standards*, FEMA 310, and FEMA 356/357 is needed in order to consistently identify and improve seismically hazardous buildings. However, earthquake engineering is not an exact science. Codes are constantly developing in an attempt to incorporate new research results and to balance safety, building performance, and cost. Considerable engineering judgement is required to properly apply the provision of the *Standards* to existing buildings. Reviews of evaluations for consistency, of construction documents for adequacy, and of construction itself for compliance with drawings and construction standards are all essential to maximize effectiveness of the project.

ICSSC RP 6 Standards of Seismic Safety for Existing Federal Buildings
Standards - 12 - January 18, 2002

Item d. is intended to serve as a generalized "grandfather" clause. It is not the intent of the *Standards* to rewrite agency procedures but to set common minimum standards for use by all Federal agencies. Once the *Standards* are formally adopted for Federal use, each agency should be able to demonstrate that its existing programs meet or exceed the *Standards*, which should be considered a minimum acceptable level of seismic safety for Federal buildings.

3.0 EVALUATION

The purpose of the evaluation described in this section is to determine whether buildings meet the Life-Safety or Immediate Occupancy performance levels as required to meet agency mission. FEMA 310 provides a seismic evaluation process for existing buildings in any region of seismicity to either the Life-Safety or Immediate Occupancy levels. The flowchart shown in Figure 3-1 provides an overview of the evaluation process, but does not include further evaluation steps that may be required based on irregularities or height limits for model building types. Note also that an agency may determine, through a risk assessment, that the level of risk is sufficiently low that mitigation is not required.

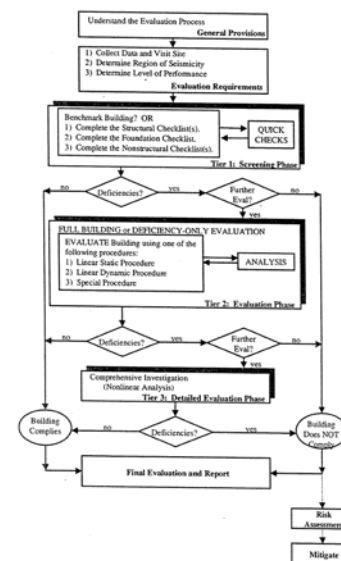


Figure 3-1: Schematic of Evaluation Process.

GreenLaw, University of Washington School of Law
Page 59 of 66

3.1 Evaluation Requirements

Seismic evaluation of a building for a specific performance level shall be carried out to satisfy the objectives of the *Standards* (Section 1.1). The level of performance shall be established by the agency having the jurisdiction over the building.

All buildings that do not meet the exemption criteria defined in Section 1.3 shall be evaluated using the procedures set forth in FEMA 310 or successor document. Buildings complying with the intent of all the requirements of FEMA 310 (or successor document) shall be deemed to meet the specified performance level, either Life-Safety or Immediate Occupancy.

Buildings may be evaluated for higher levels of performance than Life-Safety and Immediate Occupancy by other well-established procedures based on rational methods of analysis.

C3.1 Evaluation Requirements

FEMA 310 provides a three-tier process for seismic evaluation of existing buildings. The procedures allow buildings to be evaluated to either the Life-Safety or Immediate Occupancy level. A Tier 1 evaluation shall be conducted for all non-exempt buildings in accordance with the requirements of Chapter 3 of FEMA 310. The Tier 2 evaluation is intended to be a detailed follow-up on the potential deficiencies that are identified by the Tier 1 evaluation. For relatively short, regularly configured buildings with a predictable earthquake performance record, the Tier 2 evaluation need only address the identified deficiencies as outlined in FEMA 310. A full building evaluation is not needed since it will likely not identify any other deficiencies that need attention. For all other buildings, a full building evaluation is needed along with the detailed consideration of the identified deficiencies to assure that the performance objective is properly addressed. Full building Tier 2 or Tier 3 evaluations are required for Immediate Occupancy performance level, taller buildings, and buildings that resist earthquakes in a complex manner. The evaluation process may be terminated and the building deemed to be compliant with the *Standards*, if the results of analysis demonstrate that the building or its elements satisfy performance requirements.

Special and historic buildings, because of their importance and value to the society, may be evaluated to an appropriate level of performance using rational methods of analysis based on principles of mechanics. The performance level may be better than or less than required for life-safety, depending on the building and whether the historic fabric is to be protected adequately. It is important to note that FEMA 310 is intended to serve as a guideline reference for evaluation of buildings, but strict adherence to the letter of the document may not be appropriate at all times. Engineering judgement must be applied in situations where FEMA 310 is silent or not applicable. What is important is that agencies meet the intent of FEMA 310, i.e. meet the performance goal desired, when evaluating their buildings.

GreenLaw, University of Washington School of Law
Page 60 of 66

4.0 MITIGATION

4.1 Requirements

Rehabilitation of buildings shall be performed in accordance with FEMA 356 or other methods that are consistent with and achieve a Performance Level that is equivalent to those prescribed in the *Standards*. Alternatives to rehabilitation include, but are not limited to the following:

- removal of the building from an agency inventory by termination of lease agreement, sale with full disclosure, or demolition.
- permanent evacuation of the building, or
- change in occupancy of the building such that it becomes exempt in accordance with Section 1.3.

C4.1 Requirements

The *Standards* require reducing the risk to life loss in all federally owned and leased buildings and in private buildings on Federal land in the largest expected earthquake and acceptable performance of buildings requiring immediate occupancy as specified by each agency. Mitigation measures may or may not include rehabilitation of the building itself. In some cases, the nature or extent of necessary rehabilitation can be so extensive that abandonment and relocation is a cost effective alternative.

4.2 Minimum Standards and Scope for Rehabilitation

If shown by evaluation that the desired performance level is not satisfied, the rehabilitation of any building or site to attain the Life-Safety level and/or the Immediate Occupancy level shall satisfy substantially the requirements of FEMA 356.

C4.2 Minimum Standards and Scope for Rehabilitation

Since FEMA 310 is not a design standard, rehabilitation work must comply with FEMA 356 or agency standards if their requirements are more stringent than FEMA 356.

4.3 Incremental/Partial Rehabilitation

Risk-reduction by incremental or partial rehabilitation of a building is acceptable as an interim step in a complete seismic mitigation process. It shall be permitted only if the partial rehabilitation is designed and constructed in accordance with FEMA 356 and takes into account future completion of the rehabilitation objective. In addition, such partial rehabilitation shall comply with the following conditions:

- The rehabilitation measures shall not result in a reduction in the performance level of the existing building;

GreenLaw, University of Washington School of Law
Page 61 of 66

- b. The rehabilitation measures shall not create a new structural irregularity or make an existing structural irregularity more severe; and
- c. All new or rehabilitated structural components and elements shall be detailed and connected to the existing structure in compliance with the requirements of FEMA 356.

C4.3 Incremental/Partial Rehabilitation

For a variety of reasons, it may be necessary to complete a rehabilitation project in several phases. This practice is acceptable as long as rehabilitation measures do not reduce the performance level of the existing structure at any time, except during actual rehabilitation construction. The requirement demands careful consideration of the performance of the structure after each increment of rehabilitation in accordance with FEMA 356.

4.4 Local Modification of Components

Local modification of deficient components shall be permitted as an applicable rehabilitation measure as long as the resultant rehabilitation conforms to FEMA 356.

C4.4 Local Modification of Components

Some existing buildings have substantial strength and stiffness, but some of their components may not have adequate strength, toughness, or deformation capacity to satisfy the rehabilitation objectives. An appropriate rehabilitation measure for such structures may be to perform local modifications of components that are inadequate while retaining the basic configuration of the building's lateral-force resisting-system provided that the rehabilitation measures conform to FEMA 356.

4.5 Removal or Lessening of Existing Irregularities

Removal or lessening of existing irregularities shall be permitted as an applicable rehabilitation measure, provided the completed rehabilitation conforms to FEMA 356.

C4.5 Removal or Lessening of Existing Irregularities

Removal or lessening of existing irregularities may be an effective rehabilitation measure if a seismic evaluation shows that the irregularities result in the inability of the building to meet the performance objective but that their removal would achieve it.

4.6 Innovative Mitigation Methods

Innovative mitigation methods that are beyond the scope of the requirements of FEMA 356 shall be permitted, provided an analytical procedure acceptable to the agency shows that the required performance level is attained. When new and innovative rehabilitation techniques are proposed for a specific building, a peer review panel, acceptable to the agency, shall determine the adequacy of the mitigation techniques proposed by the engineer (see Section 2.3).

ICSSC RP 6 Standards of Seismic Safety for Existing Federal Buildings
Standards - 17 - January 18, 2002

GreenLaw, University of Washington School of Law
Page 62 of 66

C4.6 Innovative Mitigation Methods

New materials and structural systems, or other non-complying techniques are generally allowed by building codes subject to some form of review and approval. Generally, the alternative methods must conform to the intent of the prevailing standard. This allowance is particularly important for the seismic rehabilitation of existing buildings due to large numbers of special conditions that inevitably arise. Many private and public institutions have established procedures for peer review. Some have standing panels; others hire reviewers specifically for projects when the need arises. Agencies should establish policies to ensure the independence and qualifications of the reviewers. The policy should also cover the general procedures to be followed by the engineer and the reviewers.

4.7 Historic Buildings

Historic buildings shall not be exempted from the *Standards*, and depending upon their use may be required to meet the same performance objectives as all other buildings in the Federal inventory. Many codes covering historic buildings allow some flexibility in required performance depending on the effect of rehabilitation on important historic features. In some cases, it may be appropriate to rehabilitate an historic building to the Damage Control Structural Performance Range per FEMA 356 to ensure that the architectural fabric survives certain earthquakes.

In preserving the historic fabric of these buildings, publications such as the Secretary of the Interior's *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* and *Standards for the Treatment of Historic Properties* shall be used. Alternative methods of mitigation of seismic risks for historic buildings shall be permitted subject to the requirements of Section 4.6.

C4.7 Historic Buildings

The rehabilitation of historic buildings is a sensitive process. The design professionals must take care to protect the historical character and fabric of the building as much as possible. This reduces the flexibility and freedom to make alterations to the structure. In the development of mitigation strategies, consideration must be given to the architectural and historic value of the building. Many codes covering historic buildings allow some amount of flexibility in required performance, depending upon the effect of rehabilitation on important historic features. Modern building standards, including FEMA 356, do not specifically cover the use of all archaic materials and systems. The intent of the *Standards* is to provide essentially the same level of seismic performance objectives as for others without unreasonable impediment to the historic preservation process. Consequently, alternative mitigation methods (see Section 4.6) are allowed and encouraged when they can lessen the impact of the structural strengthening.

ICSSC RP 6 Standards of Seismic Safety for Existing Federal Buildings
Standards - 18 - January 18, 2002

GreenLaw, University of Washington School of Law
Page 63 of 66

REFERENCES

- Federal Emergency Management Agency, 1992. *NEHRP Handbook for the Seismic Evaluation of Existing Buildings*, FEMA-178, Prepared by the Building Seismic Safety Council for FEMA, Washington, D.C. 20472
- , 1997. *NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures, Part 1 and 2*, FEMA-302 and 303, Prepared by the Building Seismic Safety Council for FEMA, Washington, D.C. 20472
- , 1997. *NEHRP Guidelines for the Seismic Rehabilitation of Buildings*, FEMA-273, Prepared by the Applied Technology Council and the Building Seismic Safety Council for FEMA, Washington, D.C. 20472
- , 1997. *NEHRP Commentary on the Guidelines for the Seismic Rehabilitation of Buildings*, FEMA-274, Prepared by the Applied Technology Council and the Building Seismic Safety Council for FEMA, Washington, D.C. 20472
- , 1998. *Handbook for the Seismic Evaluation of Buildings—A Prestandard*, FEMA-310, Prepared by the American Society of Civil Engineers for FEMA, Washington, D.C. 20472
- , 2000. *Prestandard and Commentary for the Seismic Rehabilitation of Buildings*, FEMA-356, Prepared by the American Society of Civil Engineers for FEMA, Washington, D.C.
- , 2000. *Global Topics Report on the Prestandard and Commentary for the Seismic Rehabilitation of Buildings*, FEMA-357, prepared by the American Society of Civil Engineers for FEMA, Washington, D.C.
- , 2000. *NEHRP Recommended Provisions for New Buildings and Other Structures*, FEMA-368, prepared by the Building and Seismic Safety Council for FEMA, Washington, DC 20472
- , 2000. *NEHRP Recommended Provisions for New Buildings and Other Structures Part 2: Commentary*, FEMA-369, prepared by the Building and Seismic Safety Council for FEMA, Washington, DC 20472
- , 2000. *Recommended Seismic Design Criteria for New Steel Moment Frame Buildings*, FEMA-350, prepared by the SEAOC, ATC, and CUREE Joint Venture for FEMA, Washington, DC 20472
- , 2000. *Recommended Seismic Evaluation and Upgrade Criteria for Existing Welded Steel Moment Frame Structures*, FEMA 351, prepared by the SEAOC, ATC, and CUREE Joint Venture for FEMA, Washington, DC 20472

ICSSC RP 6
Standards

Standards of Seismic Safety for Existing Federal Buildings
- 19 -
January 18, 2002

GreenLaw, University of Washington School of Law
Page 64 of 66

- , 2000. *Towards Earthquake Resistant Federal Buildings – A Report to the Congress*, FEMA-360, prepared by Degenkolb Engineers and U.S. Army Civil Engineering Research Laboratory for FEMA, Washington, DC 20472 (under review)

Interagency Committee on Seismic Safety in Construction, Interagency Committee on Seismic Safety in Construction, 1992. *Guidelines and Procedures for Implementation of the Executive Order on Seismic Safety of New Building Construction*, RP-2.1-A, NISTIR 4852, National Institute of Standards and Technology, Gaithersburg, MD 20899

, 1994. *Standards of Seismic Safety for Existing Federally Owned or Leased Buildings and Commentary*, RP-4, NISTIR 5382, National Institute of Standards and Technology, Gaithersburg, MD 20899

International Code Council, 2000. *International Building Code*, Falls Church, Virginia

International Conference of Building Officials, 1994. *Uniform Code for Building Conservation*, Whittier, California

, 1997. *Uniform Building Code*, Whittier, California

Southern Building Code Congress International, *Standard Building Code*, 1999, Birmingham, Alabama


Building Officials and Code Administrators International, *National Building Code*, 1999, Country Club Hills, Illinois



ABK, 1984. *Methodology for Mitigation of Seismic Hazards in Existing Unreinforced Masonry Buildings*, (Topical Report 08), ABK joint venture, El Segundo, California

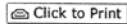
ICSSC RP 6
Standards

Standards of Seismic Safety for Existing Federal Buildings
- 20 -
January 18, 2002

GreenLaw, University of Washington School of Law
Page 65 of 66



 PRINT THIS
 Powered by  Clickability

 Click to Print

[SAVE THIS](#) | [EMAIL THIS](#) | [Close](#)

Preview spoils nuclear plant security test

From Mike Ahlers
CNN Washington Bureau

WASHINGTON (CNN) --An exercise to test preparedness against a terrorist attack at a nuclear weapons plant in Oak Ridge, Tennessee, was compromised last summer when guards got a peek at the plans, according to a report by the Department of Energy's inspector general.

The report, issued Monday, further said there was "compelling" evidence that security tests have been manipulated since the mid-1980s.

The Y-12 National Security Complex -- approximately 600 buildings over 811 acres -- was established along with the nearby Oak Ridge National Laboratory during World War II as part of the Manhattan Project to build the atomic bomb.

Both are situated on the 33,750-acre Oak Ridge Reservation that is home to a number of Department of Energy science and technology programs.

Several sensitive activities take place at the Y-12 plant, including the warehousing of enriched uranium and the dismantlement and storage of weapons. The site was being tested to see if it could defend against potential security incidents.

But the exercise was compromised when personnel were shown computer simulations of the attack in advance, according to the DOE inspector general's office.

"As a consequence, the test results were, in our judgment, tainted and unreliable," the report said.

The test manager became suspicious after guards at the Y-12 complex fended off all four simulated attacks, each involving a different scenario, Inspector General Gregory H. Friedman wrote.

Computer models had predicted the attackers would prevail in two of the scenarios.

The manager investigated and found that shortly before the June 26 test, two security workers employed by Wackenhut Services Inc. were inappropriately allowed to view the computer simulations of the four scenarios, the report said.

http://cn.usnews.printthis.clickability.com/print/action?qtid=CNN.com+-+Preview+spoils+nuclear+plant+security+test+-+Jan+26%2C+2004&expire=1&urlID=9556377&fb=Y&url... Page 1 of 2

GreenLaw, University of Washington School of Law
Page 66 of 66

CNN.com - Preview spoils nuclear plant security test - Jan. 26, 2004
4/27/04 10:28 AM

Wackenhut, based in Palm Beach Gardens, Florida, has provided security at the facility since January 2000. It is owned by Group 4 Falck A/S, a Danish company that claims to be a world leader in security services. (Wackenhut)

The report said the inspector general's office interviewed more than 30 current and former security personnel.

Some of those interviewed "provided us with compelling testimony that there has been a pattern of actions by site security personnel going back to the mid-1980s that may have negatively affected the reliability" of security tests, the report said.

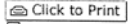
Among the reported abuses:

- Security personnel would be assigned to "tail" those acting as aggressors while they were touring Y-12 buildings in preparation for an exercise.
- Managers would increase the number of available responders and put well-prepared security personnel in place of lesser-prepared personnel before an exercise.
- In an exercise in late 2000 or early 2001, security managers told security officers "the building and target to be attacked, the exact number of adversaries, and the location where a diversion would occur."
- In simulated attacks where security personnel wore gear to determine whether they had received a simulated fatal gunshot, participants at times removed the batteries from the gear, put the batteries in backward, or placed tape, mud or Vaseline over the sensors so they would not operate properly.

The inspector general's office said that while no one had documentation to support the allegations, "the extent and the nature of the testimonial evidence" was compelling.

The Department of Energy did not immediately respond to calls from CNN. But in the report, the DOE's National Nuclear Security Administration "concurred" with the findings and said it was implementing a series of corrective actions.

Find this article at:
<http://www.cnn.com/2004/US/01/26/nuclear.plant.test/index.html>

 Click to Print

☐ Check the box to include the list of links referenced in the article.

[SAVE THIS](#) | [EMAIL THIS](#) | [Close](#)

http://cn.usnews.printthis.clickability.com/print/action?qtid=CNN.com+-+Preview+spoils+nuclear+plant+security+test+-+Jan+26%2C+2004&expire=1&urlID=9556377&fb=Y&url... Page 2 of 2